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STAPHYLOCOCCUS AUREUS PNEUMONIA

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In the standard textbooks the staphylococcus is usually noted among other micro-organisms as a possible etiologic agent in the production of bronchopneumonia. A detailed description of the clinical picture of the disease associated with the presence of this organism in the lung has thus far failed to come to our attention. This is no doubt due in part to the relative rarity of this infection as encountered in civil practice, and possibly to the lack of careful study of the bacteriology of acute respiratory affections until but recently. How rarely *Staphylococcus aureus* infection of the lung occurs and how grave the prognosis is may best be stated by noting that in a series of about 800 cases of pneumonia, drawn from all classes of the population of New York City, only thirteen cases were treated at the hospital of the Rockefeller Institute under the direction of Dr. Rufus Cole, in a period of five years from 1913 to 1918, and of these, ten patients died. Some of these cases of bronchopneumonia were apparently secondary to local infections elsewhere in the body. Two seemed to be due to a primary infection of a finger and the scalp. One followed a severe attack of measles; another complicated a Type IV pneumococcus pneumonia. In most instances, however, it was impossible to find any antecedent infection, and the lungs appeared to be involved primarily.

During the present epidemic of influenza at Camp Jackson, S. C., which began about September 15 and continued for practically one month, a very unusual opportunity was afforded to study this infection in the medical clinic, under the direction of Major W. W. Herrick, chief of the medical service. In this period about 8,100 patients, chiefly soldiers, were admitted to the base hospital with an acute febrile condition accompanied by inflammatory changes of the upper respiratory passages and diagnosed influenza. The majority of these men after from three to five days of fever made a rapid and uneventful convalescence, returning to duty within a week or ten days. On the other hand, approximately 1,400 either continued to have fever and prostration, or after an afebrile period of from three to seven days began to show clinical evidence of inflammatory change in the deeper air passages of the lungs, and the condition was diagnosed as pneumonia, either broncho or lobar in type. Many of these cases of pneumonia were relatively mild, only parts of one or two lobes being involved, usually the lower lobes and the dependent portions.

The examination of the sputum of these patients showed most frequently the presence of the pneumococcus, especially the strains designated as Type IV, less often *B. influenzae*, various types of streptococci, and various members of the gram-negative diplococcus group, usually *M. catarrhalis* or *M. flavus*. A certain number of cases, relatively few as compared with the total number of cases of pneumonia, but large when correlated with the total number of deaths, presented an entirely different picture. These patients were extremely prostrated almost from the onset of their infection. After being ill from three to four days with influenza, their condition became critical. They exhibited an unusual type of cyanosis. The cherry-red indigo-blue color was indeed very striking, though not pathognomonic of the infection to be described more fully, that associated with *Staphylococcus aureus*.

CLINICAL FEATURES OF THE DISEASE

The onset of *Staphylococcus aureus* pneumonia is almost always insidious and rarely accompanied by the chill and localized pain of a typical lobar pneumonia, though the course of the disease is extremely rapid. The facies, the anxious expression, and deep cyanosis suggest a grave prognosis from the onset, at a period when physical signs of pulmonary involvement are but scanty. Herpetic eruptions on the lips are scarcely ever noted, nor is delirium present except rarely. Usually the mind is clear almost to the end. Epistaxis is not uncommon. Occasionally pleuritic pain is complained of, but this is not usual. It is the picture of a general septicemia, so often seen in puerperal sepsis when the patient so little realizes the close proximity of death. Sweating is not a striking symptom of this type of infection, though near the end, the skin frequently becomes moist and later clammy. The fever on the whole is high, ranging between 104 and 106, with frequent remissions to 101. The pulse is relatively slow, at the onset under 100, and in only a few cases does it rise above 120 until just before death. The quality of the pulse, on the other hand, is usually poor, small, weak, and in many cases almost imperceptible. Respirations usually range between 24 and 36 and in some cases rise to 50 or 60 without much obvious discomfort. These patients rarely have the painful and labored breathing seen in pneumococcus infections.

Figure 1 illustrates the typical course of the disease in a patient who developed his infection in the hospital:

A white soldier, aged 22, and a native of Alabama, was admitted to the hospital, Sept. 6, 1918, about a week before the first cases of influenza began to appear in camp. He had

a moderately severe estivo-autumnal malaria and a chronic hookworm infection. Under treatment with quinin he had had no fever since September 10, and apparently was convalescing nicely. Although in a ward in which there were

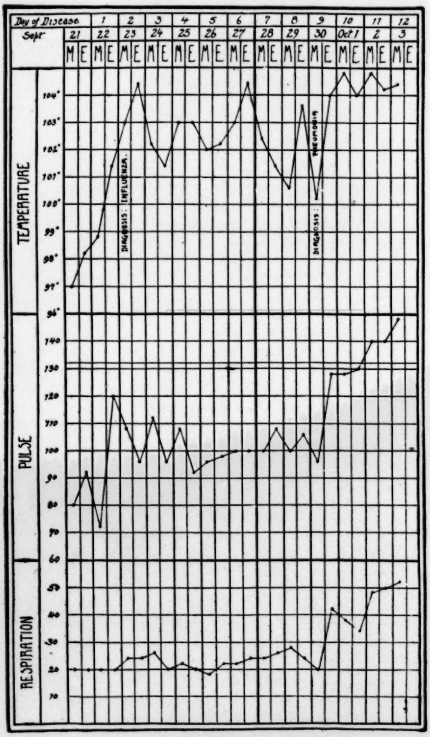


Fig. 1.—Temperature, pulse and respiration chart in a case of influenza and of bronchopneumonia of the right and left lower lobes that developed in a farmer from Alabama admitted to the hospital because of estivo-autumnal malaria. Blood count, October 3: white blood cells, 5,100; polymorphonuclears, 86 per cent.; lymphocytes, 13 per cent.; large mononuclears, 1 per cent.

no influenza patients, on the evening of September 22 he had fever and the following morning the symptoms of influenza. From that day on his temperature ranged between 101.4 and 104.4. His pulse and respirations were relatively slow until September 30, the ninth day of his illness, when signs of consolidation were noted over the right lower lobe of the lungs. From then on he rapidly became critically ill, having a pale color and a dark blue cyanosis, death following on the twelfth day of his disease.

Clinical examination of the chest of the average case reveals a very atypical type of pneumonic involvement. Signs of congestion of both lower lobes are found frequently, though in the majority of cases a diffuse process in all the lobes may be present. At the onset, only slightly diminished resonance to percussion may be elicited, with diminished breath sounds and many coarse and fine moist râles. Fluoroscopic examination of the chest at this time reveals little or nothing. But rarely are there signs of pure consolidation of one or more lobes, and then only late in the disease. Frequently there is an abundance of coarse moist râles heard throughout the chest. Rarely are pleural friction sounds elicited. In a very few cases a pleuropericardial rub may be heard. In one instance Major Herrick detected a true pericardial friction, on which sign, together with the roentgenographic evidence, the diagnosis of pericarditis was made, which was confirmed by the necropsy (Fig. 2).

Staphylococcus aureus pneumonia usually pursues a rapid course. Of the patients studied at Camp Jackson, twelve died between the first and fifth day, and seventy-three between the sixth and tenth day of the disease. In Table 1 the onset of the pneumonia was calculated from the onset of the first symptoms of influenza. It will be seen that the average length of the disease was not as long as that of ordinary primary lobar pneumonia. This fulminating character of the infection was likewise noted in the cases studied several years ago in New York.

TABLE 1.—THE DURATION OF STAPHYLOCOCCUS AUREUS PNEUMONIA

Day of the Disease on Which Death Occurred	No. Cases	Per Cent.
1–5	12	7.8
6–10	73	47.7
11–15	41	26.7
16–20	15	9.8
21–25	7	4.5
26–30	2	1.3
31–35	1	0.6
36–40	2	1.3

LABORATORY FINDINGS OF THE DISEASE

The most characteristic feature of this type of pneumonia is the sputum. When typical, the sputum is friable, purulent material of a dirty salmon-pink resembling anchovy sauce or the contents of an overripe furuncle. Occasionally the sputum is hemorrhagic, at first suggesting an acute pulmonary hemorrhage; but on close inspection its purulent character can be distinguished. If smears of such sputum are made and stained according to Gram's method, one sees field after field of gram-positive group cocci and pus cells.

Fig. 2.—Diffuse bronchopneumonia and fibrinopurulent pericarditis; pure Staphylococcus aureus infection.

One can almost give a fatal prognosis when sputum as described above is obtained. Typical sputum, however, cannot always be procured; and frequently cases that ultimately result fatally produce only greenish yellow

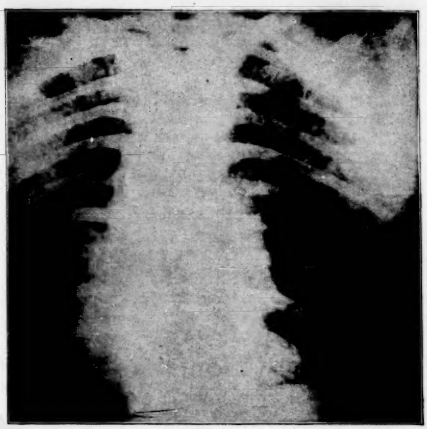


Fig. 3.—Diffuse bronchopneumonia; Staphylococcus aureus and hemolytic streptococcus recovered from the lung.

purulent material which on culture yields the staphylococcus as the predominant organism.

If sputum containing the staphylococcus is streaked on glucose-free blood agar plates, the colonies appear as opaque, round, shiny disks about 1 mm. in diameter surrounded by a wide zone of hemolysis after eighteen hours' incubation. On removal from the incubator, the colonies may appear white; but if the plates are allowed to remain a few hours in the day or sunlight, the yellow pigment appears.

In the routine examination of hundreds of specimens of sputum, *Staphylococcus aureus* is encountered frequently both from the throats of normal individuals and from those having a definite pneumococcus infection, but not usually as the predominating organism. It is impossible to say what proportion of those having pneumonic lesions and showing *Staphylococcus aureus* in the sputum are harboring the organisms in the alveoli of the lungs. A considerable number of individuals presenting these findings have recovered, but it is doubtful that many of them actually had a staphylococcus infection of the lungs when one considers the pathology of the disease. In many cases, in addition to the predominating *Staphylococcus aureus* in the sputum there were recovered various types of pneumococcus, *B. influenzae*, streptococcus and other organisms. The presence of these bacteria in association with the staphylococcus in the lung was confirmed in many instances in the postmortem examinations.

BLOOD CULTURES

During the height of the epidemic it was possible to make relatively few blood cultures, many of the laboratory staff themselves being ill, and technical difficulties with the culture medium made the possibility of obtaining bacterial growth uncertain. Two cases were reported as having positive cultures. At the Hospital of the Rockefeller Institute, positive blood cultures were obtained in 53 per cent. of the cases of *Staphylococcus aureus* infection. Consequently it is evident that a bacteremia occurs with much greater frequency than with the hemolytic streptococcus infections of the lung, in which it is quite unusual to be able to demonstrate a bacteremia except just before death and then rarely. Only one patient having a positive culture has recovered, to our knowledge, so that the presence of a bacteremia is of very grave import.

PLEURAL FLUIDS

Few cases showed clinical evidence of accumulation of fluid in the chest or pericardium. When present, the fluid was slightly cloudy amber in color, sometimes with a tinge of blood, when discovered early in the disease. If later, frankly greenish-yellow pus may be obtained. Direct smears of the fluid stained by Gram's method show many pus cells and gram-positive group cocci. Many of the bacteria may be seen phagocyted. Cultures of the fluid on plain or blood agar show the typical colony of *Staphylococcus aureus*. The culture plates should be incubated for seventy-two hours before discarding, for frequently when present, the small, colorless, dewdrop-like colonies of *B. influenzae*, which are prone to develop as satellites about the large staphylococcus colony, may escape notice after eighteen hours' incubation, when they are only pinpoint in size and are seen only with a hand lens.

If, by chance, the chest is explored and no fluid is obtained, the needle penetrating solid or semiconsolidated lung tissue, the needle may be washed out by aspirating a little plain bouillon broth culture medium into the syringe and cultures made with the blood-tinged fluid. One can frequently recover *Staphylococcus aureus* in this manner, if it is present.

Fig. 4.—Diffuse bronchopneumonia; Staphylococcus aureus and B. influenzae recovered from the lung.

BLOOD EXAMINATIONS

Under the direction of Major M. A. Barber, chief of the laboratory of the base hospital, leukocyte determinations were made of a considerable number of cases of *Staphylococcus aureus* pneumonia.

Table 2 shows the white blood cell estimations of cases grouped according to the results obtained from the postmortem cultures. It is obvious that the majority of the figures are quite unlike those obtained

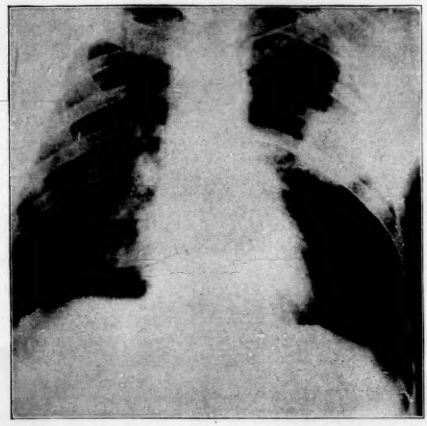


Fig. 5.—Diffuse and confluent bronchopneumonia with abscess formation; Staphylococcus aureus and pneumococcus Type IV recovered from the lung.

in ordinary lobar pneumonia. Both the patients dying of pure *Staphylococcus aureus* infection and those having a mixed infection with *B. influenzae*, pneumococcus or hemolytic streptococcus, show in many instances a leukopenia. The majority are about normal; a few show a moderate leukocytosis. Many of those having an increased number of white blood cells had localized complications, as empyema or pericarditis, as noted in the table.

TABLE 2.—BLOOD EXAMINATIONS

Staphylococcus Aureus			S. Aureus and B. Influenzae	
Number of Leukocytes	Polymorphonuclears, per Cent.		Number of Leukocytes	Polymorphonuclears, per Cent.
2,800	46		4,400	65
2,900	57		4,400	83
3,100	53		6,700	87
3,100	84		8,000	76
3,900	52		8,000	76
4,100	80		8,500	70
4,300	84		27,300	89
4,400	86		31,800	82
4,500	66			
4,800	59	S. Aureus and Pneumococcus Type I		
5,000	75		5,600	62
5,000	67			
5,100	86	S. Aureus and Pneumococcus Type II		
5,500	53		3,300	77
28,600	Pericarditis 83		6,700	86
6,300	76		13,000	78
6,900	84			
11,600	94	S. Aureus and Pneumococcus Type III		
7,000	81		5,500	64
8,000	72		12,900	93
8,400	74			
9,200	76	S. Aureus and Pneumococcus Type IV		
9,600	87		4,800	84
10,300	83		7,700	77
10,400	85		9,600	69
11,000	76		10,100	58
11,400	93		11,600	92
13,400	86		12,900	69
15,600	90		38,000	Meningitis 90
21,000	Recovered 84			
24,000	83	S. Aureus and Nonhemolytic Streptococcus		
28,400	89			
28,600	Pericarditis 90		4,000	75
35,700	Empyema 86		5,600	69
54,000	Pericarditis 95		8,500	89

It is possible that the cause of the primary epidemic infection, whatever it may be, depresses the hematopoietic system to such a degree that it is unable to react normally to infection by bacteria, which is usually accompanied by a leukocytosis. This, in turn, may offer an explanation for the production of pathologic lesions in the lungs by the bacteria that are commonly found in the nose and throat of healthy individuals and which are to be considered as secondary invaders.

The examination of the urine has shown nothing characteristic of *Staphylococcus aureus* infection, though no special investigation was made of the urine in these cases. A trace of albumin and a few granular casts are frequently seen, as in most acute febrile conditions. Apparently the disease is of so brief a duration that the formation of abscesses in the kidneys rarely takes place.

ROENTGEN EXAMINATIONS[1]

Brief mention has been made of the lack of definite localized shadows in the lungs on fluoroscopic examination early in the disease. Figures 3 and 4 are illustrative of the diffuse involvement of the lungs as shown by roentgenograms. In many instances the diffuse mottling of the whole lung suggests the lesion associated with miliary tuberculosis. In other instances, as in Figures 5 and 6, small multiple areas of consolidation can be demonstrated. Occasionally whole lobes are involved, there being a confluent bronchopneumonia present or a pneumococcus lobar type of lesion with a *Staphylococcus aureus* infection superimposed. The roentgen ray has been of great value as an aid in the diagnosis of the chest complications of this disease, namely, empyema and pericarditis (Figs. 2 and 7).

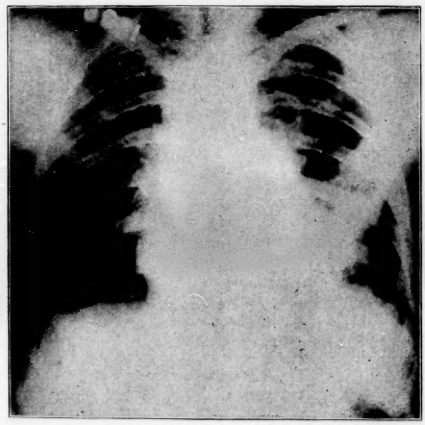


Fig. 6.—Diffuse and confluent bronchopneumonia; Staphylococcus aureus and B. influenzae recovered from the lung.

COMPLICATIONS

In this series of cases the complications have been relatively rare. This has been due largely to the high

1. The roentgen examinations, plates, and photographs were made under the direction of Lieut. G. A. Finney, M. C., U. S. Army, of Kansas, in charge of the roentgen laboratory, base hospital, Camp Jackson, S. C.

immediate mortality, the disease running a brief course, death intervening in about ten days and in some cases as early as the fifth day. Only three patients have had discoverable empyema. One of these patients, who

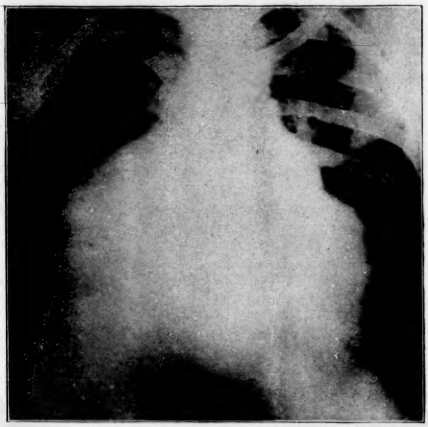


Fig. 7.—Localized suppurative pleuritis; pure culture of Staphylococcus aureus obtained from pus.

had a bacteremia early in the course of the disease, died on the ninth day with a diffuse process in the lungs and a left suppurative pleuritis. The second patient, in addition to a double empyema, had suppurative pericarditis and a bilateral otitis media, and died on the thirty-second day of the disease. The third case was quite unusual, and the patient is convalescing nicely. A large pocket of pus developed in the right chest in the angle between the mediastinum and the diaphragm (Fig. 7). This abscess was drained by resecting a portion of the fifth rib in the anterior axillary line.

Other complications have been few in number. Seven patients had acute otitis media. One patient had a staphylococcus meningitis. Nine patients had signs of meningeal irritation, but examination of the spinal fluids proved them to be normal. One patient developed a *Staphylococcus aureus* pericarditis. The pericardium, both parietal and visceral layers, were covered with a thick, shaggy coat of fibrin. A small amount of purulent fluid was found in the pericardial sac (Fig. 2).

Subcutaneous emphysema, a complication rarely seen in primary lobar pneumonia, was encountered six times in the total series of about 1,400 cases of pneumonia. In two of these cases *Staphylococcus aureus* was isolated from the lung. The emphysema has been very extensive, involving the head, neck and trunk. In one case the eyelids were completely closed. It apparently embarrassed the respirations but little.

One patient had a complicating suppurative parotitis from which the staphylococcus was cultivated. Several patients had multiple furuncles.

PATHOLOGY

Of the necropsy examinations made during this epidemic by Capts. Paul Wegeforth and W. H. Norton, in fourteen cases it has been possible to cultivate *Staphylococcus aureus* directly from the lung tissue, either as the sole organism or in association with other micro-organisms, as shown in Table 3.

From this material an unusual opportunity has been presented to study the lesions associated with the presence of *Staphylococcus aureus* in the lung tissue. The lungs on gross inspection are not usually so voluminous as those seen in the hemolytic streptococcus infections, nor do they have the same shotty feeling on palpation. Usually the dependent portions of the lungs, the lower lobes or very frequently the posterior portions of all the lobes being the dependent parts with the body in the horizontal position, are involved.

TABLE 3.—LUNG CULTURES IN FOURTEEN CASES

	No. of Cases
Staphylococcus aureus	7
Staphylococcus aureus and B. influenzae	1
Staphylococcus aureus and pneumococcus Type I	1
Staphylococcus aureus and pneumococcus Type II	1
Staphylococcus aureus and pneumococcus Type III	1
Staphylococcus aureus and pneumococcus Type IV	2
Staphylococcus aureus and Streptococcus hemolyticus	1

There may or may not be any pleural exudate. A fibrinous exudate is much less commonly found than in lobar pneumonia. The surface of the affected portions of the lung is deep purplish blue. If one examines the pleura carefully, one can usually see, in addition to showers of petechiae, small yellowish white spots, pinhead in size, situated just beneath the pleura, which prove to be minute abscesses. The cut surface of the lung may be intensely hemorrhagic, resembling the cut surface of the spleen if the course of the disease has been of brief duration, or it may have the appearance of a confluent bronchopneumonia. One does not see, however, small bronchioles standing up above the cut surface and surrounded by a zone of

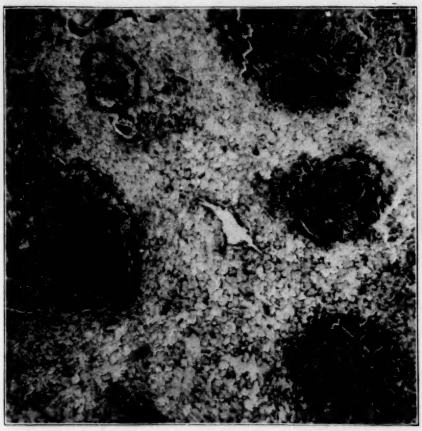


Fig. 8.—Section of lung tissue, ×13, showing abscesses; case from Hospital of the Rockefeller Institute. The photomicrographs were prepared under the direction of Mr. Louis Schmidt, Department of Illustration, Rockefeller Institute for Medical Research, New York.

dark red infiltrated tissue as in the bronchopneumonias following measles, which is the lesion most frequently associated with the hemolytic streptococcus. On the contrary, one usually finds innumerable small abscesses

ranging in size from 1 to 10 mm. in diameter. If the process is a very early one, these minute white spots may not be even broken down. If they are of longer duration, many small abscesses may have become confluent, having softened and become filled with thick, greenish yellow pus. Nine of the fourteen cases examined postmortem revealed these small abscesses. Of the cases not showing abscess formation, three were very early, the patients dying on the fourth, sixth and seventh days from the onset of the primary epidemic infection. The sections of these cases showed intense red cell congestion with rupture of the alveolar walls and exudation of serum and red cells into the alveoli. Another case, in which the patient died on the eleventh day without abscess formation, was complicated by suppurative pericarditis (Fig. 2). In the last case there was a mixed infection with *B. influenzae*, in which process *Staphylococcus aureus* apparently played a minor rôle. Direct smears of the abscesses show pus cells and many gram-positive group cocci. The majority of the abscesses tend to be situated at the periphery of the lung near the pleura, though the whole lung may be involved. The propensity of *Staphylococcus aureus* to form multiple small abscesses in the lung appears to be characteristic of this organism, for the type of lesion shown in Figures 8 and 9 from the case treated at the Hospital of the Rockefeller Institute in 1915 is similar to that illustrated in Figure 10. In the institute case there was no history of any antecedent infection.

Fig. 9.—Section of lung tissue, ×13, showing abscesses; case from Hospital of the Rockefeller Institute.

Figures 8, 9 and 10 show the circumscribed abscesses found scattered through congested lung tissue. There is at first marked engorgement of the alveolar walls with exudation into the alveoli of serum, a small amount of fibrin, and leukocytes and plasma cells containing blood pigment. There is apparently a very rapid coalescence of alveoli with the resultant formation of small, circumscribed abscesses filled with degenerated pus cells and bacteria (Figs. 10 and 11). In some instances there is an attempt to limit the process by the formation of new connective tissue. In other instances there is so rapid a solution of tissue that this reaction is scarcely evident. Figure 12 shows the lesion rapidly extending out into unaffected alveolar tissue.

Lord,[2] in describing the pathology of the bronchopneumonia following influenza, states that not infrequently small abscesses in the lungs have been found, but no mention has been made of the presence of *Staphylococcus aureus*. In our experience it seems probable that while not every case having a *Staphylococcus aureus* secondary infection in the lung may show abscess formation, the occurrence of innumerable small abscesses of the lung predicates that microorganism, excepting, of course, multiple tuberculous abscesses of the lung, which even grossly present a different pathologic picture.

Three necropsies revealed the presence of a suppurative pleuritis. In one case the pus was localized in the lower part of the left pleural cavity. In another there were collections of pus in both pleural cavities. One of the pockets, situated in the upper part of the left anterior chest, communicated with the pericardial cavity. The latter was the seat of a fibrinopurulent pericarditis.

In this series there were four cases of pericarditis. In one the necropsy disclosed no evidence of infection of the pleural cavities. The heart was covered with a thick layer of shaggy fibrinous material. An acute vegetative endocarditis of the mitral valves was demonstrated in one instance.

Suppuration of the left parotid gland occurred once. In no case did necropsy reveal any abscesses of the kidney, lesions which are frequently seen in *Staphylococcus aureus* pyemia. One abscess in the spleen was discovered.

Fig. 10.—Section of lung tissue, × about 90, showing abscess; from base hospital, Camp Jackson, S. C.

A postmortem examination of one of the two cases presenting signs of subcutaneous emphysema was made. It was impossible to discover the pathway of the escape of air from the lungs. The mediastinal

2. Lord, in Osler: System of Medicine.

tissue was filled with bubbles of air. Along the lappet of the inferior edge of the right upper lobe, the visceral pleura was distended with large bubbles of air varying in size from 1 to 10 mm. in diameter.

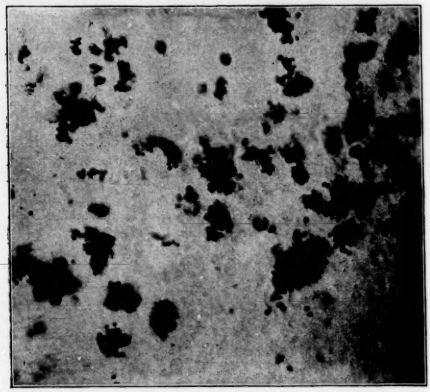


Fig. 11.—Section through a miliary abscess, ×1,000, stained for bacteria, showing group cocci, morphologically staphylococci.

The multiple foci of infection especially numerous in the periphery of the lung, together with the occasional occurrence of metastatic abscesses in other parts of the body, suggest that the condition is disseminated by the blood stream. The absence of abscesses in the liver and kidneys, however, does not support this theory. It is possible that the nonproductive, harassing cough that frequently accompanies the early stage of this epidemic infection was responsible for the dispersion of micro-organisms from the nose and throat into the deeper respiratory passages.

TABLE 4.—SUMMARY OF POSTMORTEM LUNG CULTURES

	Number
Staphylococcus aureus	92
Staphylococcus aureus and pneumococcus Type II	5
Staphylococcus aureus and pneumococcus Type III	4
Staphylococcus aureus and pneumococcus Type IV	16
Staphylococcus aureus and B. influenzae	17
Staphylococcus aureus and nonhemolytic streptococcus	3
Staphylococcus aureus and Streptococcus hemolyticus	5
Staphylococcus aureus and Streptococcus viridans	2
Staphylococcus aureus and M. flavus	1
Staphylococcus aureus and diphtheroid bacillus	1
Staphylococcus aureus and B. coli	1
Staphylococcus aureus, B. influenzae and pneumococcus Type II	1
Staphylococcus aureus, B. influenzae and pneumococcus Type III	1
Staphylococcus aureus, B. influenzae and pneumococcus Type IV	1
Staphylococcus aureus, pneumococcus Type III and B. coli	1
Staphylococcus aureus, B. influenzae and Streptococcus hemolyticus	1
Staphylococcus aureus, B. influenzae and Streptococcus viridans	1
Pneumococcus Type I	6
Pneumococcus Type II	16
Pneumococcus Type III	29
Pneumococcus Type IV	41
Pneumococcus Type I and Streptococcus hemolyticus	1
Pneumococcus Type I and B. influenzae	1
Pneumococcus Type II and B. influenzae	3
Pneumococcus Type III and B. influenzae	7
Pneumococcus Type IV and B. influenzae	2
Pneumococcus Type IV and diphtheroid bacillus	1
Pneumococcus Type IV and M. flavus	1
Pneumococcus, type undetermined	2
B. influenzae	19
B. influenzae and nonhemolytic streptococcus	2
B. influenzae and Streptococcus hemolyticus	2
B. influenzae and a gram-negative diplococcus	1
Streptococcus hemolyticus	6
Streptococcus hemolyticus and hemorrhagic septicemia bacillus group	1
Nonhemolytic streptococcus	7
Streptococcus viridans	2
Streptococcus hemolyticus and M. flavus	1
Micrococcus flavus	1
Meningococcus, Strain 10	1
A gram-negative diplococcus, culturally meningococcus	1
Hemorrhagic septicemia bacillus group	1
Acute and chronic disseminated tuberculosis	1
Total number of cases cultivated	312
Staphylococcus aureus, alone or associated with other organisms	153

POSTMORTEM CULTURES

On account of the crowded condition of the morgue, it became impossible to hold many postmortem examinations. Consequently an attempt was made to learn more of the bacterial infection of the lungs of the fatal cases by exploring the lungs postmortem with an ordinary chest exploring needle and syringe. The syringes and needles were sterilized by boiling and the skin by the application of tincture of iodin. The needle was thrust into the lung tissue and aspiration continued until about 1 c.c. of bloody fluid was obtained. This fluid was then cultivated on glucose-free blood agar plates and slants and in plain broth, and in many cases direct smears of the lung juice were made. These smears checked closely with the cultures. Table 4 details the results of these postmortem cultures. The organisms recovered in this way were found as well in the sputa, blood cultures, and empyema fluids. The number of mixed infections of the lung is surprising. But Cole and MacCallum,[3] in a study of the bacteriology of cases of bronchopneumonia following measles last winter at San Antonio, Texas, obtained similar results.

The occurrence of *Staphylococcus aureus* in the lungs in the fatal cases is quite striking, 49 per cent. of the 312 cases cultivated showing this organism present either alone, ninety-two cases, or in association with the influenza bacillus, twenty-two cases, the pneumococcus, twenty-nine cases, or various streptococci, twelve cases. In many instances, death was early predicted from the appearance of the sputum alone, and the postmortem cultures verified the information obtained from the sputum examination.

Fig. 12.—Section of lung tissue, showing a type of rapidly spreading lesion.

3. Cole, R., and MacCallum, W. G.: Pneumonia at a Base Hospital, J. A. M. A. **70**: 1146 (April 20) 1918.

The ninety-four cases showing the pneumococcus alone in the lungs were clinically more like typical lobar pneumonia, often showing extensive consolidation and pure bronchial breathing.

It is to be remarked that the organism found so frequently last winter associated with the bronchopneumonia following the epidemic of measles in the Army camps, the hemolytic streptococcus, was rarely encountered either in the sputum or in material from the lung.

On several of the plates, colonies of bacteria conforming to the characteristics of the meningococcus were found. Unfortunately, in only one case did these colonies grow on subcultures, and in this instance the organism agglutinated with Strain 10 meningococcus antiserum furnished by the Rockefeller Institute. This plague bacillus. Once before this organism was encountered in a fulminating case of bronchopneumonia treated at the Rockefeller Institute Hospital. Here again, it was found associated with *Staphylococcus aureus.*

EPIDEMIOLOGY

Pneumonia associated with *Staphylococcus aureus* occurred in almost every organization at Camp Jackson (Fig. 13). In general, where the total incidence of pneumonia was high there was a correspondingly larger number of *Staphylococcus aureus* infections.

In the First, Second and Third regiments, Field Artillery Replacement Depot, with a total strength of 6,820 men, there developed 178 cases of pneumonia, in which fourteen were found to be harboring *Staphylococcus aureus* in the lung, a percentage incidence of 7.8. In the Seventh, Eighth and Ninth regiments, F. A. D. R., organizations having a smaller quota, 6,700 men, there were 380 cases of pneumonia, in forty-three, or 11.3 per cent., of which, staphylococci were harbored in the lung.

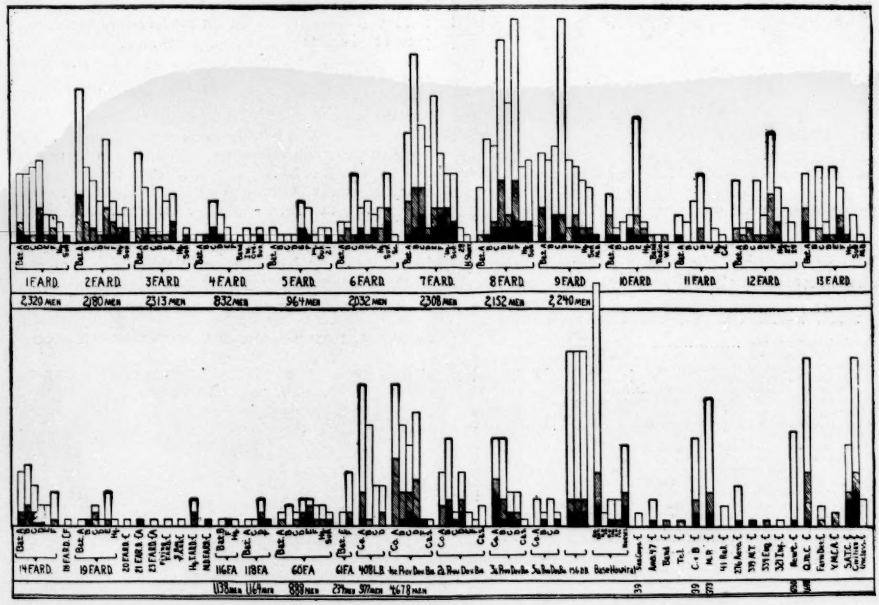


Fig. 13.—Incidence of pneumonia in military organizations at Camp Jackson, Sept. 15 to Nov. 1, 1918; outline, total cases of pneumonia; one square represents one case; black, Staphylococcus aureus deaths; shaded, deaths associated with other organisms.

In two cases, organisms conforming culturally and morphologically to bacilli of the hemorrhagic septicemia group were encountered. The colonies were moist and grew readily on blood agar. They appeared as gram-negative oval coccobacilli frequently showing bipolar staining. Some of the slides were examined by Major M. A. Barber, who has had a field experience with the bacillus of plague, and he observed the patient died without exhibiting any symptoms of meningitis that could be detected clinically. The presence of these organisms in the lungs, and the occurrence of several cases of meningococcus meningitis complications in this series of cases, opens up a new aspect to the ever increasing knowledge of the activities of the meningococcus in the human body.

In the base hospital organizations there occurred fifty-eight cases of pneumonia, of which seven, or 12 per cent., were associated with *Staphylococcus aureus.*

The higher incidence of pneumonia in the Seventh, Eighth and Ninth regiments may possibly be explained by the fact that these regiments were composed of men who were recent arrivals in camp and in the midst of their period of intensive training.

Last winter in the mortality statistics of the post-

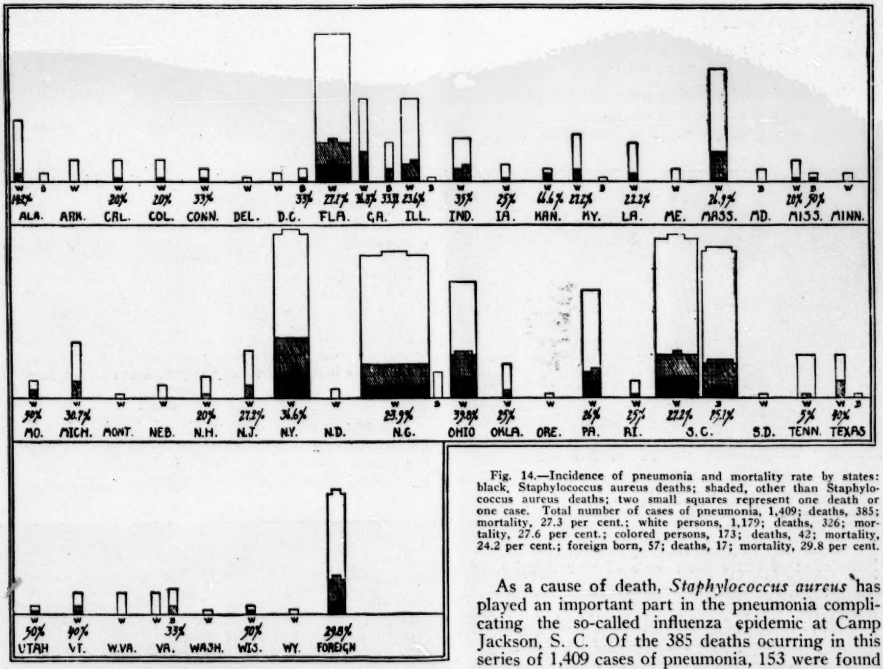
largely due to the hemolytic streptococcus, certain Southern states suffered in comparison with the Northern states.

In this camp the incidence of the virulent *Staphylococcus aureus* pneumonia was greater among the men from New York and Ohio, 15 and 18.5 per cent., respectively, than among the men from Florida, 12.5 per cent., North Carolina, 9 per cent., and South Carolina, 12 per cent. Here again the men from Ohio and New York were among the more recent arrivals.

South Carolina furnished ten *Staphylococcus aureus* pneumonias, or 7.1 per cent. of the 139 pneumonias among the negroes. These men were from one regiment of the F. A. R. D. and from labor battalions, and had been in camp for some time.

caffein and whisky were also used. Hypodermoclysis or infusions of physiologic sodium chlorid solution were administered in the event of the patient's not being able to take fluids by mouth. In a few cases, infusions of 25 per cent. glucose in physiologic sodium chlorid solution, in 250 c.c. amounts, were given once or twice a day. Practically no amelioration of the patient's condition followed the use of these therapeutic measures.

In the treatment of the complications, the one patient having a localized suppurative pleurisy was drained by a thoracotomy and costectomy and the Carrel-Dakin after-treatment instituted with excellent results. The other two patients died with complicating pericarditis and endocarditis.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UTAH VT. W.VA. VA. WASH. WIS. WY. FOREIGN

Fig. 14.—Incidence of pneumonia and mortality rate by states: black, Staphylococcus aureus deaths; shaded, other than Staphylococcus aureus deaths; two small squares represent one death or one case. Total number of cases of pneumonia, 1,409; deaths, 385; mortality, 27.3 per cent.; white persons, 1,179; deaths, 326; mortality, 27.6 per cent.; colored persons, 173; deaths, 42; mortality, 24.2 per cent.; foreign born, 57; deaths, 17; mortality, 29.8 per cent.

TREATMENT

The treatment of *Staphylococcus aureus* infection of the lung is extremely ineffectual. Apparently unless the lesions become localized, as happened in two of the cases at the Hospital of the Rockefeller Institute, or there is a localized empyema, the outlook for recovery is extremely bad. The soldiers treated at Camp Jackson were put to bed as soon as possible after they became ill. They were not allowed to get out of bed or to sit up. Very little catharsis was given, dependence being placed on a daily morning enema of soapsuds to keep the bowels open.

As a routine for pneumonia, tincture of digitalis was given in 2 c.c. doses every four hours up to 20 c.c., and continued further if indicated. Camphor in oil,

As a cause of death, *Staphylococcus aureus* has played an important part in the pneumonia complicating the so-called influenza epidemic at Camp Jackson, S. C. Of the 385 deaths ocurring in this series of 1,409 cases of pneumonia, 153 were found to be associated with *Staphylococcus aureus* in the lung. As cultures from the lung were obtained from only 312 of the 385 individuals who died, it is reasonable to suppose that this number does not represent the total mortality due to this micro-organism.

The striking features of the disease are the peculiar cherry-red indigo-blue cyanosis, the fulminating course, the lack of definite signs of consolidation of the lungs, the dirty salmon-pink purulent sputum, and usually a leukopenia.

Pathologically, if the disease is of long enough duration, it is characterized by innumerable abscesses in the lungs.

The prognosis is always grave, though a few patients occasionally survive. Only two patients in this series have recovered.

From the standpoint of our present knowledge, it would seem probable that the particular *Staphylococcus aureus* found in the lungs of these cases was no other than that found often in the mouth secretions of healthy persons. However, the depression of the individual's defensive mechanism by the primary epidemic infection was sufficient to enable these organisms subsequently to produce widespread pulmonary lesions. This, in turn, explains the occurrence of the infection in almost every organization in Camp Jackson and a higher incidence of the infection among the more recent arrivals in camp, irrespective of the states from which they came.

EARLY SUTURING OF WOUNDS OF THE FACE

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The practice of suturing wounds of the body at an early date after injury is at present arousing an active interest among surgeons. The procedure is achieving

Fig. 1 (Case 1).—Appearance of patient, Aug. 27, 1917, after wound had been closed at a casualty clearing station.

Fig. 2 (Case 1).—Septic condition of tissues and failure of sutures, September 7.

increased success, undoubtedly because of a better knowledge of the exact nature of war injuries, of a better surgical technic involved, and of a proper use of antiseptics.

If early suturing can be accomplished, the benefits are obvious: the healing process is materially shortened, many unsightly scars are avoided, and the patient undergoes a briefer period of convalescence.

There has always been a considerable divergence of opinion in regard to the most suitable time for the closure of facial wounds. Some surgeons have recommended early suturing on the grounds that undue contraction of the tissues was forestalled by bringing the lacerated borders together and that subsequent elaborate plastic operations were to a great extent evaded. Others favored late suturing at a time when the wounds were clean, asserting that suppuration and inflammation were greater hindrances than contraction of the tissues to a successful cosmetic effect. A critical analysis of the two opposing views points to the fact that both methods must be followed to obtain a minimum amount of facial disfigurement. The determining factors are the location and severity of the wounds, the amount of involvement of adjacent structures, and the degree of sepsis that has developed.

The vascularity of the facial tissues unquestionably promotes rapid healing and an early reduction or dis-

Fig. 3 (Case 2).—Result of operation at a casualty clearing station, June 25, 1917.

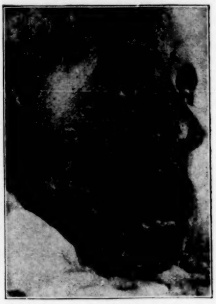

Fig. 4 (Case 2).—Appearance of patient, June 28.

appearance of inflammation; yet the advantage is partly offset by these conditions:

The majority of wounds communicate with the nasal or oral cavities, from which they cannot be isolated, and they are therefore easily and persistently reinfected.

Serious injuries are always associated with a comminution of the bone tissue, the displacement of which exaggerates the size of the wound, favors the inflammation, and facilitates the spread of sepsis.

Liberal excision of the soft tissues, which is an essential feature in the technic of primary suturing of wounds in other parts of the body, is obviously impracticable on the face.

PRIMARY SUTURING

Primary suturing of wounds of the face has been practiced frequently at casualty clearing stations, but the results, as observed at many base hospitals, would lead to the belief that the procedure is totally unsatis-

Fig. 5 (Case 3).—Appearance of patient, Sept. 23, 1917, after suturing of wounds at a casualty clearing station.

Fig. 6 (Case 3).—Resulting condition, September 27.

factory and would continue to be so, unless modifications in technic and a careful selection of suitable cases were made. Only in mild and superficial cases has healing taken place, and when the damage to the

soft tissues has been associated with bony injury, the attempted closure has ultimately given way, and brought on added inflammation, sepsis, sloughing, and discomfort to the patient.

Aside from the problem of merely averting a deformity in cases of gunshot wounds of the face and jaws, there remains the necessity of avoiding fatal complications, of establishing drainage, and of restoring function. The treatment of the bony parts cannot at any stage be dissociated from suturing or plastic operations. The shape and expression of the human face depends on the proportional development of the bony substructures; when this framework has been mutilated, its reconstruction is the first essential step in the restoration of facial appearance. And if the bone has suffered pronounced loss, suturing or plastic operations can be performed only with artificial substitutes for this framework.

Bearing in mind that sepsis, fractures and the loss of natural support are obstacles to successful primary suturing of wounds of the face, one will see that hastily conceived operations really accomplish nothing, for if the stitches fail, the progress of the patient has been retarded, while if they hold, the deformity and the suppuration are likely to be intensified.

Fig. 7 (Case 4).—Appearance of patient on admission, Aug. 2, 1916.

Fig. 8 (Case 4).—Condition on evacuation, August 20.

Cases 1, 2 and 3—unfortunately representative of a large number—demonstrate the results of injudicious primary suturing in cases of extensive wounds:

CASE 1.—Private H., wounded, Aug. 24, 1917, and admitted to the hospital, August 26, had been hit by pieces of metal which had destroyed a portion of the upper lip and caused wounds of the right cheek, right half of the lower lip, and the nose. The left eye also was injured. In the upper jaw the teeth and alveolar process of the right side and anterior region were destroyed, and in the lower jaw there was a comminuted fracture in the right bicuspid region, accompanied by loss of all teeth on the right side except the second molar. The wound had been completely closed at a casualty clearing station, as seen in a photograph taken on August 27 (Fig. 1). The tissues were extremely septic, and the sutures had failed, as shown in Figure 2, of September 7.

CASE 2.—Private L., wounded, June 22, 1917, and admitted to the hospital, June 24, had lost considerable soft tissue of the upper lip, and in addition the wound radiated to the right cheek and chin. A large amount of alveolar process and bone, together with all teeth from the right tuberosity of the maxilla to the left cuspid, had been destroyed. In the lower jaw the comminution and loss of the teeth extended from the right angle to the left cuspid. The result of operation at a casualty clearing station is shown in Figure 3 (photograph taken June 25), and the appearance on June 26 is seen in Figure 4.

CASE 3.—Second Lieutenant A., wounded, Sept. 20, 1917, and admitted to the hospital, September 22, had a lacerating wound of the lower lip, right cheek and chin which involved no appreciable loss of soft tissue. The comminution of the mandible extended from angle to angle with pronounced displacement of the fragments and a considerable loss of bony tissue. The wounds had been sutured at a casualty clearing station, as shown in Figure 5 (photograph taken September 23), but the resulting condition, September 27, is illustrated in Figure 6.

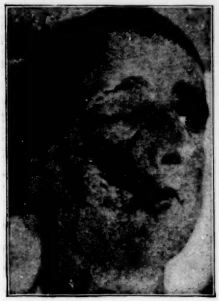

Fig. 9 (Case 5).—Appearance on admission, June 13, 1917.

Fig. 10 (Case 5).—Condition on evacuation, July 6.

Certain kinds of wounds, however, appear to respond favorably to primary suturing at advanced units. Superficial wounds with no loss of soft tissue, and also those with slight or no connection with the oral or nasal cavities, in most instances may be closed successfully. The lip borders and also the nose, being delicate and weakly supported, often unite after injury in an unnatural approximation with nearby tissue, and if conditions allow their proper location by operation at an early stage, the benefit is appreciable.

Fig. 11 (Case 6).—Appearance on admission, Aug. 8, 1916; traces are visible of early suturing prior to admission, successful only at the margin of the upper lip.

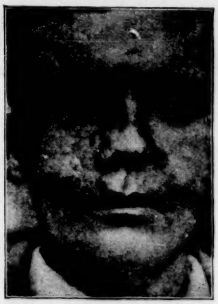

Fig. 12 (Case 6).—Condition on evacuation, September 29.

While, however, steps may have been taken on the one hand to improve the appearance of the face, on the other the individual may have been harmed in other ways. The need of avoiding a general anes-

thetic cannot be overemphasized when the patient is suffering from gunshot wounds of the face and jaw, for the presence of sepsis in the oral cavity only too often leads to respiratory complications. From our

Fig. 13 (Case 7).—Appearance on admission, March 20, 1917.

Fig. 14 (Case 7).—Condition on evacuation, August 14.

experience, a very high percentage of deaths from bronchopneumonia have given a previous history of the administration of a general anesthetic.

If suturing is attempted, it should be invariably under a local anesthetic, not only because it evades the occurrence of complications, but also because the area affected by the injury is often so reduced in sensitiveness that anesthesia is gained by small amounts of procain in conductive or infiltrative injections.

EARLY SECONDARY SUTURING

While there does not appear to be more than a limited field for primary suturing, there is broad scope for early secondary suturing. Most cases have been done between the fifth and twelfth day after injury, depending on the nature of the wound, the condition of the patient, and the severity and duration of the infection. Fixation of the bony fragments and a

Fig. 15 (Case 8).—Appearance on admission, Sept. 22, 1917.

Fig. 16 (Case 8).—Condition on evacuation, Oct. 30.

control of sepsis *always* precede the operation. The types are:

(*a*) Wounds in which there is slight or no bony injury.

(*b*) Wounds involving extensive bony injury *without loss* of soft tissue.

(*c*) The radiating parts of certain wounds, as a definite step in preparation for a later plastic operation.

In all cases the preliminary treatment of the injuries is directed to reduce the inflammation and edema as soon as possible by fomentations and frequent dressings with eusol (a solution prepared by mixing chlorinated lime, 12.5 gm., and boric acid, 12.5 gm., with water to make 1 liter, and filtering). The oral cavity and wounds are syringed freely and frequently with antiseptic solutions—such as potassium permanganate or boric acid—and adequate drainage is maintained. Then, when the wound appears clean, suturing is attempted, with special precaution to avoid tension by the use of sliding skin flaps or the undermining of the adjacent surfaces. It is often advisable to leave a small portion open to continue the proper drainage.

WOUNDS WITH SLIGHT OR NO BONY INJURY

CASE 4.—Private M., wounded, July 30, 1916, and admitted to the hospital, August 2, had a wound of the right cheek and also of the nose with some laceration (Fig. 7). No comminution from the wound to the antrum, nasal cavity, or mouth had been caused, but the upper jaw as a whole was fractured without displacement or complication. August 10,

Fig. 17 (Case 9).—Appearance on admission, June 30, 1917.

Fig. 18 (Case 9).—Condition on evacuation, October 14.

the soft tissues were practically free from sepsis and were sutured. The condition of the wound on evacuation of the patient, August 20, is shown in Figure 8.

CASE 5.—Private D., wounded, June 10, 1917, and admitted to the hospital, June 13, had an extensive lacerating wound of the right cheek (Fig. 9). The superior maxilla as a whole was fractured without comminution or displacement, and there was a simple fracture of the right ascending ramus of the mandible, without complicating factors. A small opening led to the right antrum, which, in turn, drained intra-orally at the upper right biscuspid region. The wound was closed, June 27. The right eye had been enucleated, June 15, under a general anesthetic, and it was necessary to allow slight drainage at the upper end of the wound. On evacuation, July 6, the suppuration had practically ceased. The facial appearance is shown in Figure 10.

CASE 6.—Private De., wounded, Aug. 5, 1916, and admitted to the hospital, August 8, had superficial wounds of the right supra-orbital region, cheek, nose and upper lip (Fig. 11). There was only slight bony injury to the nose. By August 26, the wounds were clean and sutured (by Major Wheeler). An external appliance was used immediately to maintain the position of all soft parts during the process of healing. September 10, a slight correction was made in the left ala of the nose. The patient was evacuated, September 20, as shown in Figure 12. The first photograph (Fig. 11) shows traces of early suturing prior to admission, which was successful only

at the margin of the upper lip. Failure may be attributed to sepsis and to excessive tension on the sutures, which in the later operation was avoided by appliances.

WOUNDS INVOLVING BONY INJURY

Wounds involving bony injury vary extensively in regard to the severity and amount of destruction. They all suppurate freely, and the inflammation is marked. The early treatment is directed toward the reduction of sepsis and swelling by the use of frequent irrigation and fomentations. All irritating and *useless* fragments of bone or teeth are removed, splints for the reduction of the fracture applied, and appliances in certain instances also used to support the soft tissues.

Suturing is not attempted until the inflammation has disappeared from the parts, and then the entire wound is not always closed, since abundant suppuration takes place from within the oral cavity from the injured bone.

Cases 7 to 11 illustrate this condition:

CASE 7.—Private T., wounded, March 17, 1917, and admitted to the hospital, March 20, had a small wound of entrance in front of the left ear and a large wound of exit on the right cheek involving the angle of the mouth. There was no

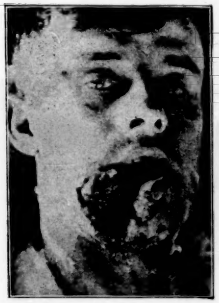

Fig. 19 (Case 10).—Appearance on admission, June 12, 1917.

Fig. 20 (Case 10).—Condition on evacuation, November 19.

appreciable loss of soft tissue (Fig. 13). About three fourths of the maxilla, and all the teeth and alveolar process, were destroyed, resulting in perforation of both hard and soft palate. Various mechanical supports were used to mold the palate, and April 1, the wound was sutured. The patient was supplied with oral restorations and evacuated, August 14, as shown in Figure 14.

CASE 8.—Private H. T., wounded, Sept. 20, 1917, and admitted to the hospital, September 22, had a large vertical wound of the lower lip and chin (Fig. 15). In the lower jaw there was comminution with much loss of bone between the bicuspid regions. A lower metal splint was adjusted, October 3. The wound appeared clean, October 7, and was sutured. The patient was evacuated, October 3, as seen in Figure 16.

CASE 9.—Gunner C., wounded, June 27, 1917, and admitted to the hospital, June 30, had a large wound extending from the lower lip to the chin, sublingual region and neck (Fig. 17), but there was no appreciable loss of soft tissue. The mandible was severely comminuted from the left to the right molar regions. The loss of mandibular continuity at the symphysis was about 1 inch. July 8, several fragments of necrotic bone were removed, and a splint was adjusted to immobilize the remaining portions of the mandible. July 15, the wounds were clean and were sutured. October 9, certain scars and folds in the submaxillary region were removed. The patient was supplied with a temporary plate and evacuated, October 14 (Fig. 18).

CASE 10.—Private B., wounded, June 10, 1917, and admitted to the hospital, June 12, had a large wound of the lower lip, right side of the chin and submaxillary region (Fig. 19). The mandible was severely comminuted from the median

Fig. 21 (Case 11).—Appearance on admission, Feb. 1, 1916.

Fig. 22 (Case 11).—Condition on evacuation, June 6.

line to the right second molar. June 17, a lower metal splint was fitted. June 27, the wound was sutured. October 17 and 29, small incisions were made in the submaxillary region for drainage and abscesses. November 1, scars on the face were excised, and on November 19 the patient was evacuated (Fig. 20).

CASE 11.—Private A. M., wounded, Jan. 29, 1916, and admitted to the hospital, February 1, had been hit by a bullet which entered anterior to and above the left angle of the mandible. There was a wound of exit which lacerated the tissues of the left upper lip and cheek to the left of the nose (Fig. 21). The mandible was uninjured. The maxilla was severely lacerated and all teeth were destroyed except the right molars and the right central, lateral and cuspid. The bone carrying these three teeth was very loose. The palate was about one half lost. February 17, the useless teeth and pieces of bone were removed. February 12, a vulcanite splint was adjusted to mold the palate vault and to immobilize the anterior segment of the maxilla. The wound was sutured on the same date. A denture was supplied and the patient was evacuated, June 6 (Fig. 22).

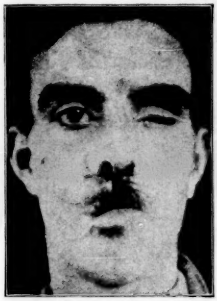

Fig. 23 (Case 1).

Fig. 24 (Case 1).—Condition on evacuation, Feb. 24, 1918.

WOUNDS INVOLVING EXTENSIVE DESTRUCTION OF THE SOFT TISSUES

The reconstruction of a part of the face must invariably be postponed until all suppuration has disappeared and the wound is in a healthy condition. It then

demands a careful planning of flaps and appliances. The success of the final operation is augmented by the careful preliminary treatment, by the control of scar formation, by perhaps judicial early secondary suturing only of certain radiating parts, and by the maintenance of the oral cavity in a condition suitable for appliances or later oral restorations.

Fig. 25 (Case 2).

Fig. 26 (Case 2).—Condition on evacuation, March 23, 1918.

To illustrate examples of this type, the completed histories of Cases 1, 2 and 3 are given:

CASE 1 (Continued, Fig. 23).—Sept. 2, the mouth was cleared of the remaining useless teeth and alveolar process, and September 8 a lower metal splint was used to immobilize the mandible. September 10, the portion of the wound radiating to the right cheek was sutured, and on the following day, upper and lower vulcanite splints, designed to maintain the facial contour, were adjusted. December 29, the upper lip was reconstructed. Feb. 12, 1918, dentures were inserted. January 26 and February 19, operations were performed to modify the shape of the mouth and lips, and to remove scars. On evacuation, February 24 (Fig. 24), the lower jaw was

Fig. 27 (Case 3).

Fig. 28 (Case 3).—Condition on evacuation, April 2, 1918.

united, and the remaining bony tissue and mucous membrane of the maxilla was in a healthy condition.

CASE 2 (Continued, Fig. 25).—July 7, there was a hemorrhage from the right antrum, which did not recur after packing. Vulcanite intermaxillary splints were fitted, July 12. July 14, that portion of the wound which radiated to the cheek was sutured. The upper lip was reconstructed, October 1. July 17 and 19, 1917, and Jan. 25 and March 12, 1918, smaller corrective operations were performed, following the two major plastic operations. Dentures were supplied and the patient was evacuated, March 23 (Fig. 26). The lower jaw was united and the mucous surfaces of the upper jaw were in a healthy condition.

CASE 3 (Continued, Fig. 27).—Oct. 4, 1917, a lower metal splint was fitted. November 3 and 5 and December 27, certain pieces of necrosed bone and useless teeth were removed. A vulcanite intermaxillary splint was inserted, November 21, which served to give the requisite fulness to the lower lip. Plastic operations were performed, Jan. 15 and March 22, 1918. On evacuation, April 2, 1918 (Fig. 28), there was fibrous union in the right bicuspid region and mobility in the left second molar region.

All operations on the soft tissues, or for cleaning the mouth, except in Case 6, were performed under a local anesthetic.

SCHISTOSOMIASIS (OF BILHARZ) ASSOCIATED WITH UNCINARIASIS

REPORT OF A CASE *

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NEW YORK

The disease caused by *Schistosomum hematobium* of Bilharz, so rare in this country as to be of little importance to the general profession or even to the sanitarian, may, nevertheless, because of its infrequency, prove of sufficient interest to warrant the publication of an account of a case. A brief description of the disease may also be of interest.

Although seldom seen here, this disease is so prevalent in Egypt, it is said, that fully 50 per cent. of the population is affected. In this country only a few cases have been reported, and all cases seen thus far have been imported.

The schistosomum belongs to the class of animal parasites known as the trematode, fluke or flatworm, and there are three distinct varieties pathogenic to man recognized by modern authorities: *Schistosomum hematobium, Schistosomum mansoni* and *Schistosomum japonicum*. Of the many names that have been attached to the particular variety here described, the term *Bilharzia hematobia* is perhaps the best known. In schistosomiasis the parasite itself occurs in the liver, and in the veins of the portal and urinary systems principally, particularly the mesenteric and vesical, depending on which variety of parasite is present.

The *Schistosomum hematobium* is bisexual and is commonly found united in pairs. The male is from 11 to 15 mm. in length and 1 mm. in breadth,[1] and has the appearance of a roundworm, this appearance being caused by the infolding of the flat body of the parasite to form a ventral, longitudinal groove, the so-called gynecophoric canal, which extends nearly its entire length, and serves for lodgment of the slender filiform female, the body of the male being actually wrapped around that of the female. On its ventral surface anteriorly are two suckers, and its body is thickly studded with small elevations. The female is longer, much more slender, darker in color, filiform and smooth. Its body is free at the ends, but is embraced in the middle by that of the male.

The ova are large and distinctive in appearance, being especially characterized by the presence of a

* From the Department of Laboratories, New York Post-Graduate Medical School and Hospital.

1. Manson, Sir Patrick: Tropical Diseases, Ed. 6, New York, Cassell & Co., 1917, p. 743.

very definite sharp spine on one end, and a capsule of varying thickness. Figure 1 presents their characteristic appearance. They are very readily detected by the low power of the microscope. For many years ova which were supposed to be those of *Schistosomum hematobium* have been observed which, instead of having a terminal, possessed a lateral spine. Numerous theories and conjectures were advanced to explain this condition, many investigators believing that the position of the egg in the tissues determined the location of the spine, others that the position of the spine denoted whether or not fertilization had taken place, and still others, that the two types of eggs belonged to different species. The latter view has recently been conclusively proved to be correct,[2] and it is now known that *Schistosomum hematobium* produces terminal-spined eggs only and *Schistosomum mansoni* lateral-spined eggs, while those of the *Schistosomum japonicum* are spineless. In general it may be stated that the first mentioned variety causes urinary disease, the second rectal disease, and the third disease of the colon, rectum and mesenteric nodes.

Until recently nothing was known of the life of this interesting parasite outside the human host, or of the manner in which it gained entrance to the body. Now it is known that the ovum, containing a living larva, leaves the body in the urine, and after coming in contact with fresh water, ruptures the enveloping capsule and escapes, swimming about actively by means of numerous ciliary projections. Later the larva, or miracidium, finds an intermediate host in the body of a certain snail—*Bulinus*—in the case of *Schistosomum hematobium*. In the liver of the snail it develops into great numbers of long cylindric bodies, the sporocysts and daughter sporocysts. Within each of these a cercaria develops and escapes into the water. This has the power of penetrating the skin of man and other animals, and so gains entrance to the blood vessels and lymphatics. By this route it finally reaches the liver, where it is ready to begin a new cycle of development into the flatworm.

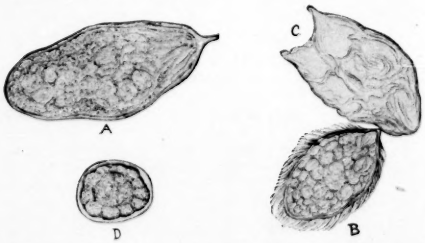

Fig. 1.—Characteristic appearance of (*A*) ovum of Schistosomum hematobium; (*B*) miracidium; (*C*) ruptured capsule; (*D*) ovum of uncinaria. (This and the accompanying illustration were drawn by K. K. Bosse.)

After about six weeks the worms reach maturity, unite in pairs and descend, against the current of blood, into the mesenteric and vesical veins, the bilharzian variety choosing the latter route, thus gaining entrance to the bladder wall, where the eggs are deposited. Just how all this is accomplished is still somewhat obscure, but it seems natural to suppose that the suckers of the male play an important part, as they do in other animal parasites. The eggs being deposited in the bladder wall, the life cycle of the parasite is completed, and in the majority of cases symptoms are produced.

The symptoms of the disease vary somewhat in different persons depending on the severity of the infection, the condition of the person, his occupation, etc. The most constant symptom is a terminal hematuria caused by the passage of the ova through the bladder wall, this passage in all probability being effected by means of the sharp terminal spinous process. Having fallen into the bladder, the ova are voided in the urine, especially in the last few drops excreted, which contain the greatest amount of blood. Pain is frequently present in the region of the bladder and along the urethra. Complications may arise from the cystitis, such as renal calculus, urinary retention, hydronephrosis or pyonephrosis, pyelitis, etc., which may cause serious consequences and even death; these give the usual symptoms of those conditions. Anemia also may result, causing constitutional predisposition to other diseases. Other complications which are said not to be uncommon are urinary fistula and urethral stricture.

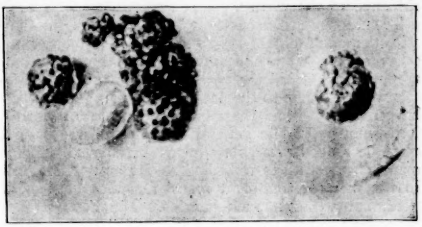

Fig. 2.—Cystoscopic view (reproduced through the courtesy of Dr. J. Bentley Squier, director of the Department of Urology).

The pathology of this disease may vary from a mild cystitis with dilated vessels, catarrhal mucous membrane, slight hemorrhage, and small vesicular or papular elevations, to a condition with marked thickening of the bladder wall, destruction of the mucosa, excrescences or new growths projecting into the bladder, encroaching on its capacity, etc. The trigon is said to be the portion most frequently affected, and thickening of this may easily cause occlusion of one or both of the ureters. There is a tendency to the formation of polypoid growths within the bladder, and these are often markedly pedunculated. The small elevations of the mucosa contain ova in large numbers; they occur chiefly in the submucous layer, and their presence tends to produce connective tissue formation, as is the case with any foreign body. The new growths are said occasionally to undergo malignant change, so that the disease must be regarded as causing a predisposition to malignancy. Other organs may also become invaded, notably the seminal vesicles, vagina, uterus and rectum; but this is rather unusual. In very exceptional instances even the viscera of the thorax have been involved.

Diagnosis is readily made by finding the ova in the urine. Examination with the cystoscope may yield valuable information as to the severity of the infection, and the extent of the damage wrought.

2. Leiper, R. T.: Relation Between Terminal-Spined and Lateral-Spined Eggs of Bilharzia, Brit. M. J. **1**: 411 (March 18) 1916.

The prognosis, according to all writers on the subject, is that of a very chronic cystitis, which is not fatal per se, but may become so through some complication. The smaller the number of worms present, the better the outlook, for obviously these cannot multiply within the human host. Those already present, however, may live for many years and continue to cause symptoms. Removal of the patient from the district in which the disease prevails will prevent reinfection and offer a better chance for eventual riddance of the worms.

Treatment must necessarily be essentially symptomatic, the chief object being to prevent some serious complication. It would appear that nothing could be administered to kill the parasite within the blood vessels without harm to the patient, although good results have recently been reported by the use of emetin intravenously.[3] The general condition of the patient must be looked after, new growths removed, fistulas repaired, ulcerations remedied so far as possible, etc. In the medical treatment many remedies have been tried, but without much success. The hope is that the parent worms may finally die, and thus the extrusion of the ova cease.

Prevention can be effected by avoiding contact with water in endemic districts that has not been rendered free from cercariae by boiling or by some chemical agent. These are able to live only forty-eight hours after being discharged from the snail, but a snail may remain infective over a long period and continue to give off cercariae.[1] Preventing excreta from coming in contact with fresh water would also be effectual, but this, of course, is a hard matter to control. It is said[1] that the cercariae are able to pass through the ordinary municipal filter bed without difficulty, but are easily killed by most of the ordinary germicides used in water purification.

In the foregoing introduction an attempt has been made to outline as briefly as possible what is known regarding the *Schistosomum hematobium* and the disease which it causes. For more extensive information concerning this and the other two types of schistosomiasis, reference is made to the more exhaustive treatises on the subject.

REPORT OF CASE

History.—M. G., a Russian Jew, aged 31, single, presented himself to the Advisory Board situated in the building of the New York Post-Graduate Medical School and Hospital in October, 1918 for examination. He had been born in Russia near Moscow, and had left Russia in 1914 for Palestine, where he remained about a year, leaving there for Egypt early in 1915. He remained in Egypt near Cairo for about a year, during which time he was engaged in farm labor, principally at digging irrigation ditches. He worked barefooted, often standing in water up to his knees or waist. After he had been engaged in this work for about one month he noticed that his urine was no longer clear, and that he had hematuria. He was warned to leave the country at this time, but remained eleven months longer, and then left for America.

Since first observing the blood he had a marked terminal hematuria which he thought had neither abated nor become more intense, although he had observed that the early morning urine contained less blood than at other times during the day. Subjectively, since the beginning, he suffered a slight pain and burning sensation along the urethra, especially near the external meatus, that would last for about five minutes after each micturition. At the onset he was also troubled with great frequency, having to urinate about every half hour; the latter symptom had greatly abated so that he now had a binocturia with only slightly or no increased frequency during the day. He also stated that during the time he remained in Egypt he lost about 25 pounds in weight, which he had not been able to regain; that his general health had not been so good as formerly; that he now became tired very easily, and that all sexual desire was lost. His present occupation was that of shipping clerk in a laundry.

Examination.—The man was sent by the Advisory Board to the laboratory for urinary examination. Observation disclosed that about 5 c.c. of what appeared to be pure blood were passed at the end of urination, and microscopic examination confirmed the presence of a large amount of blood besides large numbers of the ova of the *Schistsomum hematobium* of Bilharz. These were very typical in appearance, having a terminal spine, and it is interesting to note, from a biologic standpoint, that in a large number of examinations, during which hundreds of ova were seen, not one with a lateral or subterminal spine was found.

An attempt was made to rupture the enveloping capsule and set the miracidium free by diluting the urine with fresh water. This proved successful, one ovum being observed during the process. The rupture was sudden and complete. Figure 1 shows the ovum and miracidium as they appeared with a Leitz ocular No. 4, objective No. 6.

A blood examination was next made, which revealed: hemoglobin (by Sahli method) 100 per cent.; erythrocytes, 4,344,000; color index, 1.16; leukocytes, 8,400; differential count of leukocytes: neutrophils, 56 per cent.; lymphocytes, 43 per cent.; basophils, 1 per cent. Contrary to expectations, no eosinophils were found in this examination even after prolonged search. Subsequent examinations, however, revealed an eosinophilia ranging around 6 and 7 per cent. No change of any significance was seen in the other elements.

Chemical examination revealed: urea nitrogen, 17.2, uric acid 2.5, and creatinin 2.3 mg. per hundred c.c. of blood, which would indicate that the kidneys either were not involved, or were at least still able to carry on normal functional activity. The blood sugar was 0.13 per cent.

The Wassermann test was negative.

The patient was admitted to the hospital for observation and treatment, October 22, and a cystoscopic examination was then made by Dr. Maximilian Stern, and later a second examination was made by Dr. J. F. McCarthy. Dr. Stern reported that the trigon and ureteral orifices were pale and apparently normal; the right lateral wall had several herpetic areas consisting of yellowish white, pinhead sized spots in clusters, surrounded by a red areola; in some of these areas the white elevations were nearly spherical, as if ready to erupt. On the posterior aspect of the bladder mucosa were seen carcinomatous-like elevations, ragged and red, one of which was pedunculated and spherical, of about the size of a hazelnut. Several of these masses were present in herpes-like patches.

The physical examination was negative, revealing a man well nourished and apparently normal. The liver was normal in size, shape and consistency, so far as could be ascertained.

Since *Schistosomum hematobium* is said occasionally to invade other organs of the abdomen and pelvis besides the bladder, an examination of the feces was made for evidence of intestinal involvement. The benzidin test for occult blood was very strongly positive, and careful search with the microscope showed a complete absence of eggs of the schistosomum. Hookworm eggs, however, were present in quite large numbers. It seems most probable to suppose that the latter disease was also contracted during the patient's stay in Egypt. In several instances living hookworm embryos were observed within the egg capsules, and incubation for twenty-four hours caused a rupture of the capsule and emergence of the embryo, so that after incubation the living embryos could easily be found in the stool.

Treatment and Result.—Treatment of the case consisted chiefly of bladder irrigations with argyrol and silver nitrate. Hematuria was lessened and the patient was dicharged, October 31, the general condition being considerably improved.

3. Lemierre, A., and Lantuéjoul, P.: Un cas de bilharziose vésicale traitée par les injections intraveneuses de chlorhydrate d'émétine, Bull. et mém. Soc. méd. d. Hôp. de Paris, June 21, 1918, p. 640.

THE COMPLEMENT FIXATION TEST IN INFLUENZAL PNEUMONIA

STUDIES WITH SERUM FROM CONVALESCENT PATIENTS, THE INFLUENZA BACILLUS BEING USED AS ANTIGEN *

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These experiments were performed to ascertain whether patients who had recovered from the bronchopneumonia accompanying influenza had developed antibodies that could be demonstrated by the complement fixation test, *Bacillus influenzae* being used as antigen.

During the recent epidemic in the First Naval District, attempts were made in this laboratory to demonstrate agglutinins, precipitins or opsonins in the blood of the patients who had the disease. The results so far have been negative with *B. influenzae*. This, indeed, was disappointing, as it was hoped that individuals who had recovered might show some demonstrable changes in the blood which would indicate the part the immune processes might have played in their recovery.

This expectation was especially strengthened in view of the highly suggestive results obtained by Drs. McGuire and Redden[1] in their treatment of patients in the active stage of influenzal pneumonia with serum from patients who had recovered from the condition. Hartman,[2] and Ross and Hund[3] have described the use of citrated blood in treating similar cases, and they also report favorable results.

At first, the serums from patients having uncomplicated influenza were tested, but these did not give very satisfactory or encouraging results. Consequently, the serums from patients who had had influenzal pneumonia were studied.

The object of this series of experiments has been to throw light on these questions:

1. Does the influenza bacillus (found in more than 80 per cent. of the lungs at necropsy in this laboratory[4]) give rise to the formation of specific antibodies?
2. Is the complement fixation test of any value in confirming a diagnosis of the bronchopneumonia accompanying influenza?
3. Can one demonstrate the complement-fixing antibodies in the serums of recovered individuals, which serums have been found valuable in the serotherapy of influenzal pneumonia?
4. Did many strains or only one specific strain of *B. influenzae* become virulent during the epidemic?

ANTIGENS

Preparation.—Antigens were prepared by various methods, and their respective values were determined by titration. The methods are described in the order of antigenic superiority of different preparations:

Method 1: The influenza bacillus was obtained at necropsy from the lung, being grown on blood agar plates. Characteristic colonies were transferred to flasks containing 100 c.c. of glucose broth (0.5 per cent.) and 5 drops of sheep's blood previously diluted with broth 200 times (by volume). After three days a good growth usually was obtained. To control the purity of this culture, a loopful of it was streaked out on blood agar, and twenty-four hours later the plate was examined. If this test was satisfactory, 0.3 per cent. tricresol was added to the glucose broth culture and it was again incubated at 37 C. for twenty-four hours, when it was tested for sterility. The killed broth culture was centrifuged for twenty minutes at 2,500 revolutions per minute. The supernatant fluid was poured off and the sediment taken up in 40 c.c. of physiologic sodium chlorid solution and washed three times by centrifuging with fresh salt solution (0.85 per cent.) each time. Finally, the washed sediment was taken up in exactly 30 c.c. of saline (0.85 per cent.). Sterile beads were added and the suspension shaken for twenty minutes.

Fourteen different antigens were made in this manner, each one being prepared from a culture of influenza bacillus obtained from a different necropsy. Of this number only nine were found to possess good antigenic value.

Method 2: Five antigens made from a mixture of more than one strain of influenza bacillus were prepared, in the same way as described in Method 1. Three of these five antigens contained four different strains of the influenza bacillus; one contained six strains, while one had eight strains.

Method 3: These antigens were made as in Method 1, except that after the sediments had been washed, the bacteria were ground up in a sterile mortar and then 30 c.c. of physiologic sodium chlorid solution were added.

Method 4: Sections of lung tissue weighing 2 gm. were selected from patients that had died from influenzal bronchopneumonia. These portions of tissue were examined, and when they showed a gram-negative bacillus, morphologically and culturally resembling the Pfeiffer bacillus, 0.3 per cent. tricresol was added and the tissue was ground up in a sterile mortar. Twenty-four hours later, after incubation at 37 C., it was tested for sterility. The final volume was made up to 30 c.c. by the addition of salt solution.

Method 5: The influenza bacillus was grown as described in Method 1. The broth culture was centrifuged for twenty minutes at 2,500 revolutions per minute. The sediment was washed three times with salt solution, and the sediment was then taken up in 30 c.c. of salt solution (0.85 per cent.). This suspension was then heated for one-half hour at 56 C. It was then tested for sterility by streaking a loopful on blood-agar and incubating for twenty-four hours at 37 C. When no growth was evident after twenty-four hours, 0.1 c.c. of 1 per cent. phenol to every cubic centimeter of antigen was added as a preservative.

Method 6: A gram-negative bacillus resembling Pfeiffer's organism, by culture and morphology, was obtained from the bronchial sputum of two patients having influenzal pneumonia. (These patients subsequently recovered from the disease.) The preparation of the antigen was the same as in Method 1.

Method 7: The influenza bacillus was grown on blood agar. A staphylococcus was planted on the plate to cause a more abundant growth. After twenty-four hours, an attempt was made to wash off the influenza colonies; but a staphylococcus contamination could not be avoided by this method. Tricresol, 0.3 per cent., was added, and the final volume was made to 30 c.c. by the addition of physiologic sodium chlorid solution. After twenty-four hours' incubation, the antigen was tested for sterility.

Conclusions from a Comparative Study of These Antigens.—1. The preparations described in Method 1 form the best antigen.

* Owing to lack of space, this article is abbreviated in THE JOURNAL by the omission of a table giving the results of the tests in detail. The article appears in full in the reprints, a copy of which may be obtained on application to the author.

1. McGuire, L. W., and Redden, W. R.: Treatment of Influenzal Pneumonia by the Use of Convalescent Human Serum, J. A. M. A. **71**: 1311 (Oct. 19) 1918.
2. Hartman, F. W.: New Methods of Blood Transfusion and Serum Therapy, J. A. M. A. **71**: 1658 (Nov. 16) 1918.
3. Ross, C. W., and Hund, E. J.: Transfusion in the Desperate Pneumonias Complicating Influenza, Preliminary Report on the Successful Use of Total Immune Citrated Blood, J. A. M. A. **71**: 1992 (Dec. 14) 1918.
4. Keegan, J. J.: The Prevailing Pandemic of Influenza, J. A. M. A. **71**: 1051 (Sept. 28) 1918.

2. Grinding up the antigen gave only about 20 per cent. as many positive results as those obtained from the antigen of Method 1.

3. The polyvalent antigens were of no higher antigenic value than those made from a single strain.

4. Antigens made from bacteria grown on solid mediums (Method 7) were not satisfactory, since the suspensions contained too much blood and it was difficult to obtain a suspension that did not also contain the staphylococcus. The antigenic value was very low.

5. The antigens obtained from the organism that was found in the bronchial sputum was valueless.

6. Heating apparently destroys, in a large measure, the complement-fixing substance of a bacterial antigen.[5]

7. The organism obtained from the early cases in the epidemic supplied a better antigen for the fixation test than those from the late cases.

8. The antigens do not deteriorate very rapidly. Some of them retained their power to fix complement three months.

TITRATIONS

The anticomplementary and hemolytic values of each antigen were determined by titration. In finding the anticomplementary dose, varying amounts of the antigen, 0.02, 0.05, 0.1, 0.3, 0.5, 0.7, 0.8, 1.3, 1.5 and 2 c.c. of the undiluted antigen, were added to a series of tubes. To each tube, 1 c.c. of 1:20 complement was added. The volume of each tube was made to 3 c.c. with physiologic sodium chlorid solution. The tubes were then incubated for one and one-half hours at 37 C. Then 0.5 c.c. of amboceptor containing 2 units and 0.5 c.c. of a 2.5 per cent. suspension of sheep's corpuscles were added. The tubes were reincubated for three-quarters hour, when a reading was made. That tube which first showed inhibition of hemolysis contained the anticomplementary unit of antigen.

Of all the antigens made, only three were found to be anticomplementary. In these instances, the antigenic unit was one quarter of the anticomplementary unit. The many antigens that were not found to be anticomplementary were used undiluted. It was found that usually 0.2 c.c. of the undiluted antigen was the antigenic unit when a definite volume of glucose broth (100 c.c.) was used and when the final volume was made to 30 c.c. with salt solution, as described in Method 1.

Each antigen was then titrated against six known positive and six known negative serums before it was used in a series of experiments.

When the antigenic unit was found, this amount of antigen was mixed with 0.5 c.c. of a 2.5 per cent. suspension of sheep's corpuscles, and these were incubated for one-half hour at 37 C. This procedure determined whether the antigen was at all hemolytic in the amount representing one unit.

When the foregoing factors were definitely controlled, the antigen could be used in the tests.

Only a brief description of the reagents used is necessary, since the methods of preparation are practically the same as in the Wassermann reaction:

Complement.—Pooled serum of guinea-pig's blood was used. One hour after the blood was obtained, it was centrifuged and the serum was diluted 1:10 with physiologic sodium chlorid solution. In preparing the complement for titration, 10 c.c. of physiologic sodium chlorid solution were added to 10 c.c. of the 10 per cent. guinea-pig serum.

5. Perry, M. W., and Kolmer, J. A.: A Study of the Immunizing Properties of Bacterial Vaccines Prepared after Various Methods, J. Immunol. 3:258 (July) 1918.

Serum.—The serums were inactivated for twenty minutes at 56 C. It was found that heating had also a tendency toward destroying antibodies.

Amboceptor.—The hemolytic amboceptor was the same as that used in this laboratory in doing the Wassermann tests. Briefly, it was obtained by immunizing rabbits with sheep's corpuscles. Two units of amboceptor were used in the fixation tests. The amboceptor was diluted so that 0.5 c.c. contained two units.

Sheep's Cells.—These were obtained by a puncture of the jugular vein of the sheep under sterile precautions. The blood was defibrinated with sterile beads, and then 10 c.c. of the blood were put in a 40 c.c. graduated tube. Physiologic sodium chlorid solution was added to 35 c.c. This corpuscle suspension was centrifuged for fifteen minutes at 2,500 revolutions per minute. These corpuscles were washed three times in this way. After the final washing, the supernatant fluid was poured off and the packed cells were read. A 2.5 per cent. suspension of these washed sheep's cells was made by diluting with physiologic sodium chlorid solution.

Sensitized Corpuscles.—Sensitized corpuscles consist of equal parts of 2.5 per cent. suspension of sheep's corpuscles and diluted amboceptor. This mixture was incubated for one-half hour at 37 C. One c.c. of this mixture was used in the complement fixation test.

Before each series of tests, a preliminary combined titration of complement and amboceptor was made, as shown in Table 1.

TABLE 1.—PRELIMINARY COMBINED TITRATION OF COMPLEMENT AND AMBOCEPTOR

Tube	Complement 1:20 Dilution	Amboceptor 2 Units in 0.5 c.c.	Sheep's Cells 2.5% Suspension
	C.c.	C.c.	C.c.
1	0.5	0.5	0.5
2	0.4	0.5	0.5
3	0.3	0.5	0.5
4	0.2	0.5	0.5
5	1.0	0.3	0.5
6	1.0	0.2	0.5

To each one of the six tubes in Table 1, physiologic sodium chlorid solution was added to make a volume of 3 c.c. The tubes were incubated at 37 C. for one-half hour. In reading, the least amount of guinea-pig serum causing complete hemolysis determined the size of the unit of complement. If the amboceptor was satisfactory, Tube 5 showed complete hemolysis, while Tube 6 showed moderate hemolysis.

After the combined titration of the complement and amboceptor had been completed, the complement fixation test was thus performed:

Two rows of tubes were set up, as indicated in Table 2. One-tenth c.c. of each of the serums was flowed into one of the tubes in each of the two rows. To each tube in the front row 0.2 c.c. of the antigen and one unit of complement were added. To the rear tubes only one unit of complement was added. The volume of every tube was made to 2 c.c. by the addition of physiologic sodium chlorid solution. Therefore, the front row for each test contained one unit of complement, 0.2 c.c. of antigen and 0.1 c.c. of serum and salt solution, while the respective rear tube contained all of these except the antigen.

These additional controls were made with every series of tests:

(*a*) Antigen control, containing the unit of complement, the unit of antigen, and physiologic sodium chlorid solution to 2 c.c.

(*b*) Hemolytic control, containing the unit of complement and physiologic sodium chlorid solution to 2 c.c.

All the tubes were then shaken thoroughly and incubated for one and one-half hours at 37 C. Then 1 c.c.

of sensitized corpuscles was added to each tube and they were reincubated for three quarters of an hour, when a preliminary reading was made. The tubes were put into the refrigerator, and a final reading was made the next morning.

As mentioned above, these tubes were incubated at 37 C. for one and one half hours, when 1 c.c. of sensitized corpuscles was added. The tubes were reincubated then for three quarters of an hour and a preliminary reading was made. There should be complete hemolysis in Tubes II, III and IV. If the serum is anticomplementary, there will be inhibition of hemolysis in Tube II, and no reading can be made in Tube I. But if this is not so and there is inhibition of hemolysis in Tube I, then this serum is positive, while it is negative when there is hemolysis.

PERFORMANCE OF THE EXPERIMENTS

As mentioned previously, this series of experiments was performed to determine the occurrence of the complement fixation test on serums from patients who were recovering from influenzal pneumonia, the condition having been determined by physical and clinical signs. To control the specificity of the reaction, a number of individuals were examined who gave no history of the disease during the epidemic and who stated that they were not subject to colds and coughs. Some stress was laid on the last factor, since an ambulatory form of influenza is very probable.

TABLE 2.—SCHEME FOR THE COMPLEMENT FIXATION TEST

Tube II Unknown Serum 0.1 c.c. of serum (Patient A) 1 unit of complement Physiologic sodium chlorid solution added to 2 c.c.	**Tube IV** Antigen Control 0.2 c.c. of antigen 1 unit of complement Physiologic sodium chlorid solution added to 2 c.c.
Tube I 0.1 c.c. of serum (Patient A) 1 unit of complement 1 unit of antigen (0.2 c.c.) Physiologic sodium chlorid solution to 2 c.c.	**Tube III** Hemolytic Control 1 unit of complement Physiologic sodium chlorid solution to 2 c.c.

It may be questioned whether such serums could be used as satisfactory controls, as it may be that those that did not come down with the disease had enough antibodies or natural immunity to overcome the virulent organism. This may explain the positive results obtained from some of the controls.

A few serums were tested from patients who still had a high temperature due to the pneumonia, and these are also included in Table 3.

It was endeavored to test blood from patients at different periods of convalescence. Some serums were tested when the temperature had been normal one day, while others were tested when the patients had been convalescent for forty-one days.

When serums were found to be positive, they were later tested at different intervals so as to determine how long the antibodies persisted.

The test and control serums were all negative to the Wassermann reaction, which was performed simultaneously.

MAIN RESULTS FROM THE TESTS

1. Of the 300 control serums tested, twenty-nine, or 9.6 per cent., reacted positively.

2. Of the 315 serums from patients convalescing from influenzal pneumonia, the complement fixation reaction showed 161 positive reactions, 134 negative and twenty anticomplementary reactions. In other words, excluding the anticomplementary serums, 54.5 per cent. of convalescent influenzal pneumonia serums were positive.

3. Of the 161 positive serums, twenty (12.42 per cent.) were +, thirty-four (21.12 per cent.) were ++, forty-five (27.95 per cent.) were +++, and sixty-two (38.51 per cent) were ++++.

4. Some of the serums were positive one day after the patient had become convalescent. Other serums from patients convalescent forty-one days were positive. Most of the positive reactions were obtained with serums from individuals who were convalescent from three to five days.

5. Some serums that reacted positively three months ago still can fix complements.

TABLE 3.—TESTS IN WHICH WHITE BLOOD COUNTS WERE MADE

White Blood Count					
Above 10,000 per C.Mm.			Below 10,000 per C.Mm.		
Case	W. B. C.	Result	Case	W. B. C.	Result*
1	16,800	+++	12	7,400	Neg.
2	17,000	Neg.	17	2,800	Neg.
4	15,000	Neg.	20	7,400	+++
5	13,000	++++	24	4,400	++++
6	15,200	++	29	7,600	Neg.
7	11,200	Neg.	45	5,000	++
9	12,600	Neg.	47	9,400	+++
14	20,000	++++	55	5,400	Neg.
15	14,800	+++	56	6,400	Neg.
16	13,000	Neg.	57	5,800	Neg.
27	10,400	++	76	6,200	++
31	12,600	++++	78	8,400	Neg.
41	16,000	++++	87	6,500	Neg.
50	11,400	Neg.	90	7,600	Neg.
58	12,200	Neg.	92	4,200	+
63	14,600	+++	97	6,200	++
65	16,000	++	100	5,000	Neg.
66	19,000	++++	106	9,200	Neg.
72	15,200	++	111	4,600	Neg.
73	10,200	+++	287	6,600	Neg.
74	28,800	+++	292	5,600	Neg.
80	15,200	+	295	3,400	Neg.
103	15,000	+++	303	8,400	Neg.
115	16,000	+++	122	4,600	Neg.
124	10,200	++++	130	6,200	Neg.
154	12,400	Neg.	132	4,200	++
158	11,200	++	136	8,800	++
166	12,400	++++	142	7,800	Neg.
180	13,000	+	146	4,200	++
197	17,400	Neg.	152	5,200	Neg.
188	15,800	Neg.	162	5,400	Neg.
192	11,800	++	176	8,900	+
194	10,400	Neg.	178	7,000	+
200	13,000	Neg.	186	9,400	Neg.
201	12,400	++++	191	3,800	Neg.
208	12,400	Neg.	198	2,800	Neg.
229	12,500	++++	208	5,000	++++
234	15,400	Neg.	210	7,400	Neg.
238	14,600	++++	213	4,600	Neg.
248	11,400	Neg.	223	5,800	Neg.
250	18,200	++++	241	8,800	Neg.
258	12,600	++++	243	7,400	Neg.
260	18,200	+++	249	6,400	Neg.
272	18,000	++++	251	5,400	+
279	15,000	Neg.	261	9,200	Neg.
283	15,200	Neg.	274	4,400	+
288	17,000	Neg.	276	5,200	Neg.
291	10,600	Neg.	285	4,500	Neg.
299	25,000	++++	286	6,200	Neg.

* In this column + indicates hemolysis between 75 and 100 per cent.; ++, hemolysis between 50 and 75 per cent.; +++, hemolysis between 25 and 50 per cent.; Neg., complete hemolysis.

6. The fixation test on many serums made during the time that the patient was still acutely ill or just beginning convalescence were in many cases negative or slightly positive; but when these serums were kept in the refrigerator for from six days to three weeks, many gave strongly positive reactions.

7. White blood counts were not made on all influenzal pneumonia patients admitted, but of those patients on whom one was made and whose serums were tested by the complement fixation test, Table 3 has been made. This table shows that of the forty-nine patients who had a white count above 10,000, thirty (61.28 per cent.) gave a positive reaction; while of

the same number having a white count below 10,000 per cubic millimeter, only fifteen (30.61 per cent) produced a positive complement fixation test.

COMMENT

The complement binding factor of serum from influenzal pneumonia patients is probably a very weak one. At first, when two units of complement were used, many more negative results were obtained than when one unit was finally resorted to. Two units probably produced a marked excess of complement for that factor of the serum that causes complement fixation.

The results suggest strongly that the influenza bacillus forms specific antibodies that will fix complement when this organism is used as an antigen.

It is difficult to conclude definitely from these experiments alone whether only one or many strains of the influenza bacillus were active during the epidemic; but this can be stated: Polyvalent antigens did not give more positive results than a monovalent one. If many strains of this organism were present, then one could have expected more positive reactions in these experiments than were obtained from the use of an antigen made from one strain.

Serums that gave positive tests were also found more suitable for the serotherapy of influenzal pneumonia patients. It seems possible that persons who have not had influenzal pneumonia, but whose serum gives a positive reaction, might be useful as donors.

Since some of the reactions were inconstant, it must be concluded that the complement fixation test in influenzal pneumonia cannot yet be accepted as a diagnostic test; but it may be of some value together with other diagnostic methods in confirming the condition as having been present, at least in more than 50 per cent. of the cases.

This presence of complement fixation would indicate that the influenza bacillus plays an important part in the complicating pneumonia of influenza; but the results furnish no conclusive evidence of a primary etiologic rôle of the influenza bacillus.

SUMMARY

Experiments were made for the purpose of determining whether specific antibodies existed in the serum of patients who were convalescing from influenzal pneumonia.

The influenza bacillus found in more than 80 per cent. of the necropsies at this laboratory was used as an antigen.

The presence of antibodies was demonstrated by the complement fixation test, for it was found that out of the 300 control serums 9.6 per cent. gave a positive reaction, while of the 295 serums from convalescent influenzal pneumonia patients, 54.5 per cent. had antibodies that fixed complement.

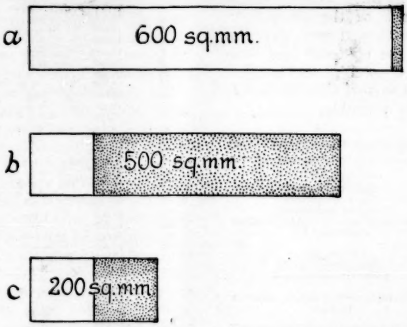

Fig. 1.—Relative importance of eye exposure to direct droplet spray: *a*, average total eye surface exposed; shaded area represents proportion of time not exposed, due to winking; *b*, average total mouth area exposed in talking; shaded area represents proportion of time not exposed, due to closure; *c*, average total area of cross-section of nares exposed; shaded area represents proportion of time not exposed, owing to protected position and expiration.

THE TRANSMISSION OF INFECTION THROUGH THE EYE

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Recently the eye has received little or no attention as a factor in the transmission of acute respiratory infections. It has been disregarded in planning measures for the prevention of the spread of contagious diseases. This was especially true in the recent epidemic of influenza. No provision has been made in the ward routine of contagious hospitals for the protection of the eye of healthy persons in attendance on the unmasked sick. A brief consideration of the anatomic relations and physiologic facts of the lacrimatory-nasal mechanism, together with certain simple experiments illustrating its modus operandi, will convince one of the reality and importance of this portal of entry for pathogenic micro-organisms.

It has long been known that large numbers of various organisms, including the pneumococcus, streptococcus, influenza bacillus, and many others, may be recovered from the conjunctival sac, especially if there is obstruction to the overflow of tears. The conjunctival sac is never sterile. The source of contamination has been attributed largely to the impingement on the conjunctiva of the eyeball and the cornea of dust particles bearing micro-organisms. It is evident that droplets sprayed from the mouths of other persons during the act of talking, laughing, coughing, sneezing, etc., must be another frequent source.

It is now generally accepted that many contagious diseases are transmitted from one person to another through this direct droplet spray. Experimentally it has been shown by Doust and Lyon[1] that a person infected with a micro-organism (*B. prodigiosus*) may project this organism from his mouth during ordinary conversation or loud speech to a distance of 4 feet, and that during coughing, infected material from the mouth might be projected at least 10 feet. These observers, together with Haller and Colwell,[2] proved that this promiscuous spraying of the environment by an infected person could be entirely prevented by the wearing of a properly constructed gauze face mask. There is no experimental proof, however, that the reverse relation holds true, that is, that the noninfected healthy person is entirely protected from droplet spray by the wearing of such a mask. Droplets may not enter the nose or mouth when a face mask is worn, but the conjunctiva remains openly exposed. The relative

1. Doust, B. C., and Lyon, A. B.: Face Masks in Infections of the Respiratory Tract, J. A. M. A. **71**: 1216 (Oct. 12) 1918.
2. Haller, D. A., and Colwell, R. C.: The Protective Qualities of the Gauze Face Mask, J. A. M. A. **71**: 1213 (Oct. 12) 1918.

importance of this portal of entry will become more evident if the conditions under which infection occurs are closely examined.

THEORETICAL CONSIDERATIONS

Infections are most likely to be transmitted during the waking hours when a person has his widest range of activity and is coming into intimate association with numbers of other human beings. This is especally true in crowds, in which the range for droplet spray is short. Under these conditions the mouth is closed a large part of the time, in particular when another (perhaps infected) person is talking to (spraying) the noninfected healthy person who assumes the attitude of a listener. With the mouth closed, only the lips may receive the droplets; the bacteria dry there and perish, or perhaps they are swept into the mouth by movements of the tongue. Furthermore, when a healthy person is talking, air currents are created that are adverse to the entrance of droplets from the infected. The mouth surface exposed to droplet spray may consequently be represented as averaging about 100 sq. mm.

The nares at such times may not be directly exposed, owing to the protected anatomic position when the head is slightly inclined forward. With every expiration, adverse air currents are created. Hence, although a cross-section of the nares gives an area of about 200 sq. mm., this is available for direct droplet spray less than half of the time.

Contrasted to these areas, some 600 sq. mm. of eye surface area is constantly exposed to droplet spray during the waking hours, except for the very brief intervals during the act of winking, an act which is in itself of significance for the mechanism, as will be seen later. Certainly the chances of infecting the eye are fully as good as those of infecting the nose and mouth, if not better. These relations are brought out graphically in Figure 1.

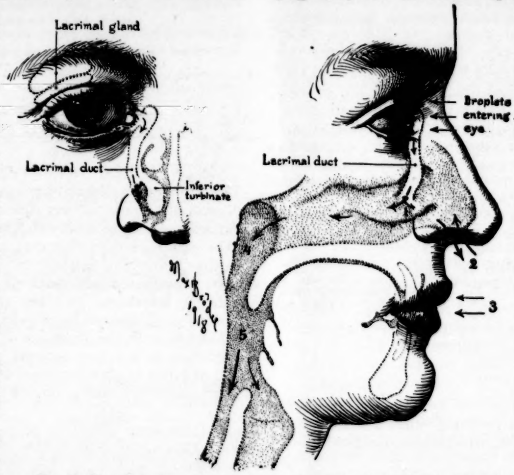

Fig. 2.—The lacrimatory-nasal mechanism for the mechanical disposition of organisms entering the upper respiratory tract.

THE LACRIMATORY-NASAL MECHANISM

The disposition of organisms reaching the conjunctival sac through droplet spray or dust particles may be easily demonstrated by the use of some harmless saprophyte, preferably a pigment producer, such as *B. prodigiosus*. This will be made clear by the subjoined experiments and Figure 2.

By the winking movement of the lids, the surface of the eye is swept at regular intervals, and the lacrimal secretion, which has no bactericidal action, together with the contained micro-organisms, is carried into the nose through the lacrimal duct (Fig. 2, 1).

EXPERIMENTS

EXPERIMENT 1.—*To show the appearance of organisms in the nose after introduction into the conjunctival sac.*

With a capillary pipet, 1 drop of suspension[3] was instilled into the eye near the inner canthus in each of five subjects. Just previous to the instillation, a straight swab was introduced into the nostril on the same side and smeared on the first quarter of an agar plate to demonstrate the absence of *B. prodigiosus* from the nasal fossa at the beginning of the experiment. In a similar manner a swab was introduced on the same side at five, ten and fifteen minute intervals after the instillation, and then smeared on agar plates. The plates were examined at twenty-four and forty-eight hours for colonies with characteristic pigmentation. The result of such an experiment is shown in Table 1.

It is evident from this experiment that *B. prodigiosus* instilled into the conjunctival sac is quickly carried into the nose, and that the organisms may there be recovered on a nasal swab within five minutes of the instillation. From the opening of the lacrimal duct (Fig. 2, 1) two courses are open. They may pass out through the anterior nares. This occurs when there is excessive secretion, or when the nose is "blown." Secondly, they may be carried backward into the nasopharynx (Fig. 2, 4). The topography of the nose favors the latter disposition, and this normally occurs in the absence of the factors mentioned above.

EXPERIMENT 2.—*To show appearance of organisms in the nasopharynx after introduction into the conjunctival sac.*

The details of the technic are the same as in Experiment 1. In addition, at the end of thirty minutes a long wire swab, slightly bent at the end, was introduced into the nasopharynx through the mouth and smeared on the agar plates. The result is shown in Table 2.

EXPERIMENT 3.—*To show appearance of organisms in the nasopharynx after introduction of diminishing doses into the conjunctival sac.*

The details of the technic are the same as in Experiment 2. In addition, the standard suspension used on the first subject was diluted 1:100 in the second, 1:1,000 in the third, and 1:10,000 in the fourth. A single drop from a capillary pipet was the dose instilled in each instance. The result is shown in Table 3.

Experiments 2 and 3 demonstrate that even very small doses of *B. prodigiosus* instilled into the conjunctival sac may be recovered from the nasopharynx from fifteen to thirty minutes later.

The disposition of organisms from this point (Fig. 2, 5) may follow one of three courses: 1. They may

3. The standard suspension of B. prodigiosus used in these experiments was prepared by growing a 2 inch streak on an agar slant for from eighteen to twenty-four hours at incubator temperature, and washing the organisms off the surface with 2 c.c. of salt solution.

pass outward through the mouth with the sputum. 2. They may be carried into the larynx and reach the lower respiratory tract. 3. They may be carried downward into the esophagus with the swallowing movements, and perish in the intestinal canal or be excreted with the feces. The latter is probably the most frequent course.

TABLE 1.—INSTILLATION OF B. PRODIGIOSUS INTO CONJUNCTIVAL SAC; RECOVERY FROM THE NOSE

		Result of Nasal Swabs				
No.	Subject	0 Min.	5 Min.	10 Min.	15 Min.	30 Min.
1	M. K. F.	0	0	0	+	—
2	P.	0	0	0	—	+
3	B.	0	0	+	—	+
4	Br.	0	+	—	—	+
5	Pa.	0	+	+	+	+

Specimens of the stool were obtained from Subjects 7, 9 and 10, about twenty-four hours after they had submitted to Experiment 2. In one of the three (Subject 7), a viable *B. prodigiosus* was recovered. Success might have attended the other attempts had cultures been taken of successive passages.

The disposition outlined above holds true for the bulk of organisms introduced into the conjunctival sac. Larger or smaller numbers are left along the course, particularly on the nasal mucous membrane and in the adenoid tissue of the nasopharynx. If the biology of the organism is unsuited to the environment, its growth is inhibited or it is perhaps destroyed by neutralizing substances in the nose. If the biology of the organism

TABLE 2.—INSTILLATION OF B. PRODIGIOSUS INTO CONJUNCTIVAL SAC; RECOVERY FROM THE NOSE AND THE NASOPHARYNX

		Result of Nasal Swab				Result of Nasopharyngeal Swab	
No.	Subject	0 Min.	5 Min.	10 Min.	15 Min.	15 Min.	30 Min.
6	S.	0	+	+	+	+	0
7	W.	0	+	0	+	+	+
8	V. G.	0	0	+	+	+	+
9	D.	0	+	+	+	+	+
10	T.	0	+	+	+	+	0

is such that the environment is suitable for reproduction, growth ensues with resulting stimulation of protective mechanisms and manifestations of infection of the respiratory tract.

LIMITATIONS OF THE GAUZE FACE MASK

From the foregoing it is clear that the eyes present a relatively large surface for the reception of droplet spray, and that organisms introduced into the conjunctival sac quickly reach the nose and throat. It follows that the gauze face mask fails completely to close this portal of entry. This fact may be demonstrated experimentally:

EXPERIMENT 4.—*To demonstrate infection of the upper respiratory tract by droplet spray while a gauze face mask is being worn.*

The standard suspension of organisms was diluted 1:20 with salt solution so that it was slightly but definitely turbid. The suspension was placed in an atomizer connected with a compressed air tank. After a swab had been taken to show the absence of *B. prodigiosus* from the nose of the subject at the beginning of the experiment, the nose and mouth were covered with a gauze mask. All subjects, except 20 and 21, used a mask consisting of eight thicknesses of gauze, of 28 by 24 mesh. Subjects 20 and 21 used a three layer buttercloth mask constructed according to the specifications of Doust and Lyon.[1] Besides wearing the mask, the first five subjects were instructed to hold their hands over their mouths, closing off the nostrils and holding the breath during exposure. The atomizer was directed toward the faces of the subjects from a distance of from 3 to 4 feet, and the spray applied twice—each application lasting about a second—imitating a couple of coughs. With the last four subjects, particular care was taken to exclude the possibility of organisms gaining entrance through inhalation. The swabbing was done in one room, and the exposure to spray in another. The subjects, having previously been masked, were brought into a room where they were exposed, and then immediately withdrew to the room where the swabs were taken. The mask was worn during the whole twenty minutes of observation except when the swabs were being taken.

The result is shown in Table 4.

The result is unequivocal. It may be repeated by any one for his own satisfaction. The possibility of infecting the upper respiratory tract through the eye by direct droplet spray, even when a properly constructed mask is worn, is an easily demonstrated fact.

TABLE 3.—INSTILLATION OF B. PRODIGIOSUS INTO CONJUNCTIVAL SAC; DECREASING DOSAGE; RECOVERY FROM NOSE AND NASOPHARYNX

		Mil. Organisms per C.c. in Suspension Used	Recovery from Nose			Recovery from Nasopharynx	
No.	Subject		0 Min.	5 Min.	10 Min.	15 Min.	30 Min.
11	C.	450	0	+	+	+	0
12	N.	4.5	0	+	+	0	0
13	W.	0.45	0	+	+	+	—
14	H.	0.045	0	0	0	0	—

COMMENT

The frequency with which respiratory infections—for example, acute coryza, measles and influenza—begin with a conjunctivitis suggests that this entrance for the causative organism may not be uncommon. It is realized that the conjunctivitis in certain cases is simply a suffusion and part of the general mucous membrane response. In other cases the priority and prominence of this symptom indicates rather a primary relationship with the disease. Certainly the evidence is sufficient to warrant serious consideration of this portal of entry in planning measures for the prevention of the spread of contagion. The obvious means of

TABLE 4.—DROPLET SPRAY OF B. PRODIGIOSUS; DISTANCE 3 TO 4 FEET; NOSE AND MOUTH PROTECTED BY GAUZE MASK; EYES UNPROTECTED; RECOVERY OF ORGANISM FROM NOSE AND NASOPHARYNX

		Nose				Nasopharynx	
No.	Subject	0 Min.	5 Min.	10 Min.	15 Min.	15 Min.	20 Min.
15	L.	0	+	+	+	—	+
16	Bo.	0	+	+	+	—	0
17	Y.	0	+	+	+	—	0
18	Sak.	0	+	+	+	—	+
19	Na.	0	+	+	+	—	+
20	L.	0	+	+	+	—	+
21	G.	0	+	+	+	—	+
22	Pe.	0	+	+	+	0	+
23	T.	0	+	0	0	0	0
24	Hu.	0	+	+	+	0	0
25	Tu.	0	0	0	+	0	0

protection is the wearing of a large lens or pair of goggles in addition to the gauze mask by those who are within range of droplet spray from heavily infected individuals. In this connection it is interesting to note that during the great epidemics of plague that have from time to time swept over the Old World, masking of the whole face, eyes included, has been wonderfully effective.

The gauze mask is efficient in preventing the infected person from spraying his environment, and should be used for this purpose when possible. It is impracti-

cable to mask very sick patients, especially those with respiratory difficulty. These patients are prolific distributors of droplet spray. Physicians and attendants, even though properly masked, cannot come within close range of such persons without the danger of infection through the eye. Public health administrators should bear in mind the limitations to the protective value of the gauze mask when worn by the noninfected. The pathologist at the necropsy table should remember that infectious material splashed into the eyes is just as potent as if it had been directly implanted on the mucous membrane of the nasopharynx.

CONCLUSIONS

1. The eyes offer a relatively large surface area for the reception of droplets sprayed from the mouths of other persons.

2. An organism introduced into the conjunctival sac may be recovered from the nose in five minutes, from the throat in fifteen minutes, and from the stool in twenty-four hours.

3. The upper respiratory tract of a person wearing a properly constructed mask may be infected by exposing the eye briefly to direct droplet spray.

4. This portal of entry is of importance in the transmission of acute respiratory infections.

HYSTERICAL APHONIA ASSOCIATED WITH LATENT SYPHILIS

REPORT OF CASE

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TAKOMA PARK, D. C.

A well developed man, aged 36, 5 feet 11 inches in height, whose habits were good, who drank beer occasionally, smoked moderately and was a telegrapher, enlisted in the Army, Jan. 10, 1918, at Fort Thomas, Ky. While on a furlough at home, he developed a cold and an eruption which a civilian physician diagnosed as measles. Hoarseness accompanied by a cough first appeared at this time and progressively increased until January 18, when the patient completely lost his voice. He was sent to Fort Wood, N. Y., for treatment. The post surgeon there referred him to the Manhattan Ear and Throat Hospital, where he received active treatment from February 20 to March 30. His condition apparently remained the same; several Wassermann tests had been negative, and no definite diagnosis could be made. The soldier was then transferred to the Canal Zone in the belief that a climatic change might affect the aphonia, and reported there for duty, April 15, where he was shortly afterward admitted to the Ancon Hospital.

July 6, a blood test gave a ++ Wassermann reaction for the first time; July 11, the spinal fluid gave a negative Wassermann reaction; July 12, a blood test was again ++. With a history of a sore on the penis in 1906 and the presence of a scar there, together with a ++ Wassermann reaction, it was decided to institute specific treatment. He therefore received five arsphenamin injections intravenously, six mercuric salicylate injections intramuscularly, and potassium iodid by mouth between July 23 and August 19. August 8 and 19, the Wassermann tests were reported negative with no improvement in the aphonia.

September 30, the patient was transferred to the Walter Reed General Hospital for final disposition. Two Wassermann tests were taken, one, October 2, and the other, October 7; the former was negative, the latter ±. A neurologic examination revealed slightly exaggerated knee jerks, a marked Romberg sign, but no Babinski reflex or ankle clonus. The laryngologic examination revealed no pathologic condition of the vocal cords; the tonsils were in a state of chronic hypertrophy; otherwise the patient was normal. In view of the foregoing symptoms, a lumbar puncture was performed, October 17; the spinal fluid was clear and under normal pressure. All the tests, namely, the Wassermann, globulin, colloidal gold and cell count, were negative. Although the biologic tests were normal, still we felt justified in administering further specific treatment in the expectation that the therapeutic test would throw further light in clearing up the diagnosis.

Accordingly the patient received four intravenous injections of arsphenamin, 0.5 gm. each, four injections of mercuric salicylate intramuscularly at weekly intervals, and potassium iodid by mouth, from October 22 to November 12. The Wassermann test, November 4, was still ± with no change in the patient's aphonia and the Romberg sign.

After much deliberation, it was decided to examine the larynx under ether anesthesia. December 12, the patient was anesthetized and the larynx examined by the direct method. Nothing abnormal was found to account for the aphonia; only a slight congestion of the false cords was noted. When reacting from the anesthetic, the patient began to speak in normal pitch and his voice remained so up to December 31, when it was decided to return him to duty. The Romberg sign was still present, which we believe to be purely functional. Before the administration of the anesthetic the patient was told that an operation would be performed in his throat, after which his voice would be restored. After the patient reacted, he complained of some soreness which he thought was due to the operation. The passage of the laryngoscope probably set up enough irritation to account for the complaint.

DIFFERENTIAL DIAGNOSIS

From the standpoint of differential diagnosis, the following conditions had to be considered:

1. *Acute and Chronic Laryngitis.*—This condition, with the symptoms starting as an acute laryngitis and going into a chronic condition, was thought not probable, as no improvement followed local treatment.

2. *Tuberculosis of the Larynx.*—This condition following an attack of measles had to be considered. The symptoms appeared suddenly, there was no pain, and there was an absence of laryngeal and pulmonary signs, all of which eliminated this diagnosis.

3. *New Growths.*—There was no local or constitutional evidence of these.

4. *Interstitial Neuritis of the Recurrent Laryngeal Nerve Caused by Syphilis.*—Such a condition causing paresis or paralysis would have responded quickly under specific treatment; there was no improvement in this case.

5. *Final Diagnosis of Hysterical Aphonia.*—This was made because of restoration of voice after the administration of an anesthetic to an individual who probably had latent syphilis.

Cost of Preventable Illness.—The cost of sickness in the state of Illinois for the year ended July 1, 1918, reached the total of $154,881,685, according to a statement issued, January 16, by Dr. C. St. Clair Drake, director of the state department of public health. In the order of their annual cost to the state through sickness and death the several diseases embraced in the study rank as follows: tuberculosis, $114,905,500; pneumonia, $30,909,360; typhoid fever, $3,006,900; malaria, $2,660,860; diphtheria, $1,156,625; whooping cough, $735,220; smallpox, $675,600; infantile paralysis, $461,600; measles, $456,020; epidemic spinal meningitis, $425,700; scarlet fever, $388,300.

TREATMENT OF THE PNEUMONIC DISTURBANCE COMPLICATING INFLUENZA

THE TRANSFUSION OF CITRATED IMMUNE BLOOD

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An emergency hospital was established to care for the employees of an industrial plant during the recent influenza epidemic, and in all, 285 cases were cared for in the unit.[1] Unfortunately, the majority of the patients were of the lower type, with environments of poor home and personal hygiene, physically derelict. Many had no care, and suffered even neglect, before admittance. We were thus confronted with a great number of neglected, seriously ill, not a few of whom were moribund. It was a most discouraging circumstance to stand by and observe a death rate of more than 42.9 per cent. in the so-called pneumonias with the various treatments used. We were stimulated to attempt the practical application of theory, and are gratified over a result far beyond our fondest expectations.

While much has been done on the etiology, especially from a bacteriologic standpoint, even to the extent of producing a questionably similar disease in monkeys, by the introduction of a coccobacillus (Plasencia[2] of Havana), we are at present less justified in ascribing influenza to any one particular identified micro-organism than we are in ascribing scarlet fever to a streptococcus infection. However, we must all concede that we are dealing with an extremely virulent intoxicant of uncertain origin.

The clinical course indicates that the intoxicant acts in the main on the central nervous system, as is manifested by: (*a*) prostration with an apathetic state; (*b*) disturbed heat mechanism; (*c*) a central type of gastro-intestinal disturbance; (*d*) peripheral sensory nerve disturbance; (*e*) vasomotor disturbance without evidence of myocardial insufficiency, and (*f*) depression of the respiratory center.

Meyer and Gottlieb[3] thus write concerning the relation of circulatory failure to vasomotor paresis:

> Circulatory failure resulting from vasoparesis occurs in advanced stages in many toxic conditions where altered excitability of the medulla obtains. It was formerly considered due to a cardiac weakness. However, Romberg and his co-workers have correctly insisted that in the course of infectious diseases, disturbances of the circulation develop which closely resemble the picture seen in vasomotor paresis. Using pneumococci and diphtheria as well as pyocyaneus cultures, they were able to show experimentally that at any rate during a long period, during which the blood pressure continued to fall, this was chiefly due to a vasoparesis and not to any direct harmful action on the heart (Romberg, Passler, Bruhns, Müller, Passler and Rolly), and the same holds true in experimentally produced septic peritonitis (Romberg and Heinecke).

That this phenomenon of vasoparesis is early established in this disease is clinically seen by the slow, low tension pulse, early congestive cyanosis, hyperemia of the viscera, especially those rich in vascular supply, epistaxis nasae and gastro-intestinalis, with a concomitant good status of the myocardium.

Associated with this vasoparesis, there undoubtedly coexists a circulating inflammatory intoxicant, as is well shown by a destructive type of leukopenia (a high Arneth's scale). These factors co-working explain the almost universal finding of a hemorrhagic transudate into the richly vascular tissues, and such a status, that is, one in which lowered resistant powers must obtain, predisposes toward secondary infection by well known organisms, such as the streptococcus, pneumococcus and influenza bacillus, especially when the entrance is through simple channels, such as the upper and lower respiratory passages.

In cases progressing to a fatal termination, the clearness and certainty of this interpretation is well shown. The vasoparesis, the blood destruction (leukopenia and lessened coagulability) progress to extreme degree, while the myocardium is disturbed only to a minor degree, and stimulation of the latter may produce in reality an active diffuse pulmonary hemorrhage. The patient expires from a drowning process and respiratory failure, unless there previously existed a severe acute or chronic myocardial condition which might be the cause of death, or a contributory cause.

That all cases of influenza demonstrate the foregoing phenomena to a certain degree is well established. That some cases progress a bit farther to a so-called pneumonia from which the patients recover without treatment is also well established. From this, it is fair to assume that recovery depends on the presence of natural protective elements in the circulation and tissues.

TABLE 1.—ACTIVITIES OF THE BLOOD

Blood	1. Physiologic activity	1. Stimulating normal blood production 2. Control of capillary tree—(*a*) Caliber; (*b*) Rate of flow; (*c*) Integrity of the endothelium 3. Coagulability
	2. Immune activity.	1. Active—Leukocytosis, phagocytosis, chematosis, increased complement, etc. 2. Passive—(1) Normal immune content; (2) convalescent immune content
	3. Mechanical activity	1. Dilution 2. Neutralization 3. Elimination

From the foregoing facts and theory, it is evident that a treatment to be logical must be directed in such a way as to (*a*) neutralize or render the intoxicant inert, (*b*) correct the vasomotor paresis, and (*c*) prevent the blood destruction with its destructive leukopenia and lessened coagulability. It is theoretically established that an immunity either active or passive is corrective to such circumstance.

That clinical application of this phase of theory has produced remarkable results, let alone affirmation, is well shown in the work on immune serum by McGuire and Redden[4] and others. However, the experimental work of Herst, S. Solis-Cohen and M. Solis-Cohen[5] gives evidence of bactericidal properties in the uncoagulated blood of immune species such as pigeons, which

1. Ross, C. W., and Hund, E. J.: Transfusion in the Desperate Pneumonias Complicating Influenza, J. A. M. A. **71**: 1992 (Dec. 14) 1918.
2. Cuba Letter, J. A. M. A. **71**: 1928 (Dec. 7) 1918.
3. Meyer, H. H., and Gottlieb, R.: Pharmacology, Clinical and Experimental, Philadelphia, J. B. Lippincott Company, 1914, p. 309.
4. McGuire, L. W., and Redden, W. R.: Treatment of Influenzal Pneumonia by the Use of Convalescent Human Serum, J. A. M. A. **71**: 1311 (Oct. 19) 1918.
5. Herst, G. D.; Solis-Cohen, Solomon, and Solis-Cohen, Meyer: J. Immunol. **3**: 61 (July) 1918.

property ceases on defibrinization of the blood, and the defibrinated blood often acts as a good culture medium for that particular micro-organism. This explains satisfactorily the failure of immune serum in some cases. The introduction of total immune blood either citrated or by direct transfusion will present all of the advantages of serum and theoretically many added factors as seen in the scheme given in Table 1.

INDICATIONS FOR USE

It has been our experience in the observation of the pneumonic complications in this unit and elsewhere that a process once started becomes of a fulminant and rapidly progressive nature. If this circumstance is permitted and the reserve powers are exhausted, treatment of any type is of no avail. The activity should and must be brought into play before the reserve is depleted to any great degree. It is of no consequence to err on the too early application. Briefly, when cyanosis develops and becomes persistent; when toxemia is well established, as is noted in nervous manifestations, destructive type of leukopenia and diminished urinary chlorids; when the pulse diminishes in tension and the first pulmonary signs (which very often come late) are elicited, then the time for transfusion has arrived. Temperature is a faulty guide, especially a drop, for this does not necessarily mean an improvement, and often means a failure of reaction. A slightly elevated temperature, and as we have seen in some cases, a subnormal temperature with marked nervous manifestations, is an ominous sign.

TABLE 2.—RESULTS

	Transfusion	Symptomatic
Cases treated	28	21
Average days ill before admitted	4	3
Average days of transfusion	8	...
Average temperature before transfusion	101.8	103
Average temperature after transfusion	101.2	...
Average white blood count before transfusion	5,020	4,800
Average white blood count after transfusion	7,450	.....
Average white blood count fourth day after transfusion	11,790	.....
Average days until temperature normal	9.5	15
Average days ill	19	20
Average days in hospital	15	17
Recoveries	22	12
Deaths	6, or 21.4%	9, or 42.8%

One transfusion is often not sufficient. If it is found that the anticipated effect of the transfusion is not obtained, we repeat in from twelve to twenty-four hours and again after that time if necessary. The anticipated effects are a walling off or prevention of further progress of the pulmonary disturbance, the lessening of the toxic state, a better circulatory and respiratory tonus, increased leukocyte count, and a suitable temperature. Careful technic, especially in preliminary tests, makes repetition a safe procedure.

Table 2 includes our experimental cases, that is, patients who were moribund at the time of transfusion, and a better understanding and more fairness to statistics will be obtained by the supplementary information obtained from close clinical and technical observation. The features that stand out prominently are: (*a*) the temperature; (*b*) the blood count, and (*c*) the mortality.

The average temperature before transfusion is low because a few of the early cases were of the nonresistant type, with low and even subnormal temperature and muttering delirium at the time of transfusion. The important feature is that the average time for a normal temperature was 9.5 days of illness or 1.5 days after transfusion, while in the symptomatically treated case the normal line was reached about the fifteenth day. As seen below, several of the cases presented the typical curve of crisis.

The blood count is of interest. The desperate cases presented a uniformly low white blood count of from 1,800 to 3,000 and a tendency to lower as the disease progressed. In a few of the cases transfused in a terminal condition no improvement was obtained, but in the responding cases a characteristic curve was obtained, namely, a persistent rise in white blood count, in some cases up to 24,000, until the process was controlled, and then a drop to normal. The cases treated symptomatically presented a white blood count which remained stationary usually between 3,500 and 6,000, a fact which may explain the long convalescence, frequent complications and sequelae. Further, Arneth's index proved to be very high at first, and returned to an approximate normal shortly after transfusion. The mortality rate of 42.8 per cent. for the symptomatically treated cases and 21.4 per cent. for the transfused cases gives a 21.4 per cent. improvement. This would be even better had we excluded our first experimental cases which were beyond help at time of transfusion.

The clinical observation presents a walling off of the process, a more rapid resolution, an earlier relief of toxic symptoms, and a shorter convalescence. Complications and sequelae were practically nil.

TECHNIC

It is of great import as a matter of safety to match carefully the blood of donor and recipient. It is further of great value to perform not alone a Wassermann reaction but a close clinical observation for syphilis. Poorly matched bloods may not alone prove valueless as far as therapeusis is concerned, but may add a disturbing and even destructive process which may prove fatal. Theoretically, incompatibilities in this disease should be of frequent occurrence, and there was much clinical evidence to substantiate this.

TABLE 3.—TESTS OF BLOOD FOR ISOHEMOLYSINS AND ISOHEMAGGLUTININS

Number of tests made	105
Number of incompatibilities	37
Incompatibility due to presence of isohemolysins:	
Serum of donor	8
Serum of recipient	21
Incompatibility due to presence of isohemagglutinins:	
Serum of donor	0
Serum of recipient	7
Incompatibility due to presence of both isohemolysins and isohemagglutinins:	
Serum of donor	0
Serum of recipient	3
Mutual incompatibility:	
Hemolysis by serum of both donor and recipient	2

The controls remained normal in all of the 105 tests.

In Table 3 is given a complete summary of the results noted in testing the blood for isohemolysins and isohemagglutinins for the purpose of giving blood transfusions to patients suffering from pneumonic complications of influenza. The donors in all cases were chosen from a number of persons who had recovered from the disease and gave negative Wassermann tests.

The technic employed was as set forth by Kolmar,[6] and was briefly as follows:

Specimens of blood and blood cells are thus obtained from both the prospective donor and the recipient: Four or five c.c. of blood are drawn from a prominent vein with a glass syringe, and of this quantity 0.5 c.c. is diluted with 4 c.c. of 1 per cent.

6. Kolmer, J. A.: A Practical Text-Book of Infection, Immunity and Specific Therapy, Ed. 2, Philadelphia, W. B. Saunders Company, 1918.

sodium citrate in 0.98 per cent. sodium chlorid solution; the remainder is allowed to clot. The blood cells are thrown down in the citrate solution with the aid of a centrifuge and washed twice with 0.98 per cent. sodium chlorid solution; they are then suspended in 9 parts of 0.98 per cent. sodium chlorid solution—this is the dilution used in the test. The blood serum is then separated from the blood clot with the aid of a centrifuge and removed to a clean, dry test tube.

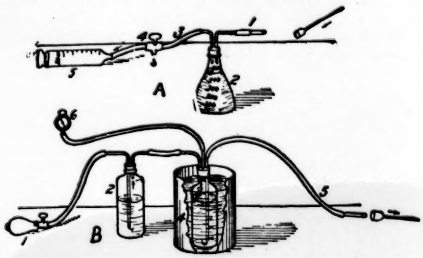

Fig. 1.—Apparatus for transfusion: *A*, receiving apparatus: 1, receiving tube with very short rubber connection (all paraffined); 2, 500 c.c. Ehrlenmeyer flask (paraffined); 3, suction tube for partially exhausting air from flask; 4, two-way stopcock; 5, 20 c.c. syringe; *B*, apparatus for giving blood to recipient: 1, bulb and valve (from sphygmomanometer); 2, wash bottle (containing mercuric chlorid, 1:500); 3, delivery bottle for citrated blood; 4, vessel containing water at temperature of 43 C.; 5, delivery tube; 6, pressure gage (to measure rate of flow and pressure).

The serum and cell suspensions having been prepared as directed with each specimen of blood, the following mixtures are then placed in test tubes (preferably small ones of 15 by 75 mm. size):

Tube 1: Donor cell suspension, 1 drop; recipient serum, 4 drops.
Tube 2: Recipient cell suspension, 1 drop; donor serum, 4 drops.
Tube 3: Donor cell suspension, 1 drop; donor serum, 4 drops.
Tube 4: Recipient cell suspension, 1 drop; recipient serum, 4 drops.
Tube 5: Donor cell suspension, 1 drop; sodium chlorid solution, 0.98 per cent., 4 drops.
Tube 6: Recipient cell suspension, 1 drop; sodium chlorid solution, 0.98 per cent., 4 drops.

Then 1 c.c. of sodium chlorid solution, 0.98 per cent., is added to each tube with a graduated pipet and the tubes are placed in an incubator at 37 C. for two hours or in a water bath at the same temperature for one hour. Hemolysis or agglutination are easily perceived on macroscopic examination. If there is doubt regarding hemolysis, the tubes may be centrifuged. (Tubes 3 and 4 are controls on serum of both donor and recipient, and Tubes 5 and 6 are controls on the erythrocytes and sodium chlorid solution.)

These mixtures should be set up within twenty-four hours after obtaining specimens to obviate danger of deterioration of the native complement. The tubes must be well shaken before being subjected to incubation.

Our work in this unit was done in wards of a supply depot and in tents. In such an emergency, when a surgically clean place is not available, it is essential to avoid air contamination as much as possible. Further, many of our patients were delirious, and therefore direct transfusion was impossible. We chose, by necessity, the citrate method and devised a closed apparatus for giving and receiving blood. Our experience has demonstrated that this procedure is exceeding simple, devoid of danger and readily applicable to bedside conditions.

The receiving apparatus (Fig. 1 *A*) is self explanatory. If a platinum needle of 17 or larger caliber is used, if the flask is well paraffined, if the lead tube and connections are well coated internally with sterile, pure petrolatum, and if the citrate solution in the container is of proper temperature and is shaken gently while receiving the blood, no difficulties should be encountered. The usual surgical technic is employed in controlling the venous supply and the taking of the blood. Care should be used not to cause sufficient vacuum to collapse the vein.

The giving apparatus (Fig. 1 *B*) is also self explanatory. Care should be taken to keep the citrated blood at body temperature, which can be done by keeping the container in a water bath and making the delivery tube as short as possible. The pressure gage is of great value. This will give an index as to rate, volume and pressure of flow, and also any obstruction in the apparatus. It is advisable to work between 40 and 80 mm. of mercury pressure.

The dose of blood varies according to the amount the patient can tolerate. However, owing to the extreme relaxation of the blood vessels and fair state of the myocardium, large amounts may be used in the majority of cases without adding additional stress to the circulatory system. We use from 250 to 500 c.c. of blood at a time, preferably the larger amount. It is advisable to fortify with a hypodermic injection of 1-50 grain of digitalein one-half hour before transfusion. Blood pressure and pulse readings should be performed while the transfusion is in progress; these will give an index as to the amount tolerated by the patient.

The strength of citrate solution used varies with the dose of blood. The larger the dose of blood, the smaller should be the volume and greater the strength of the citrate solution in order not to introduce too large an amount of fluid. A 1 per cent. solution of sodium citrate in physiologic sodium chlorid solution will citrate an equal volume of blood. A 2 per cent. solution in physiologic sodium chlorid solution will citrate two volumes of blood, etc. We use a 1 per cent. solution for a dose up to 150 c.c.; a 2 per cent. for a dose up to 300 c.c.; a 3 per cent. for a dose up to 400 c.c., and a 4 per cent. for a dose of 500 c.c. of blood.

The frequent reaction of a slight chill followed by a profuse perspiration and drop in temperature should be treated symptomatically or merely by support; medication is not as a rule indicated. Should anaphylaxis develop, it is well to use atropin. We always have a

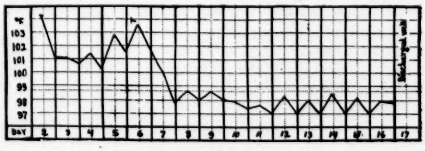

Fig. 2.—Clinical chart, Case 3.

hypodermic dose of 1-50 grain of atropin sulphate at hand during transfusion to meet such a development. If the transfusion is given too rapidly, a feeling of constriction in the chest and a slight respiratory distress occur, which cease if the rate of transfusion is decreased. With careful technic, no shock should be encountered.

REPORT OF CASES

The accompanying charts and brief histories are of the cases in which transfusion was performed in one of the units. The charts are graphic and note the highest and lowest temperatures, pulse and respirations in twenty-four hours.

CASE 1.—C. M. C., a well developed boy of 16, with typical influenza, entered the first day. The white blood count was 2,600. Bronchopneumonia developed the fourth day, and transfusion was performed the fifth day. There was an immediate drop of temperature to an uneventful recovery. The white blood count was from 4,100 to 9,600. The patient was discharged on the twelfth day.

CASE 2.—G. I. C., aged 24, with a previous tuberculous history and a typical tuberculous appearance, entered on the sixth day of illness, markedly delirious and cyanotic, with an axillary

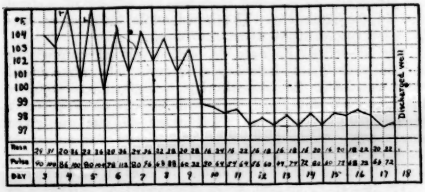

Fig. 3.—Clinical chart, Case 4.

temperature of 105.4. Physical examination revealed a diffuse bronchopneumonic process. The white blood count was very low, 3,000. The urine contained albumin, and chlorids were in diminished amounts. The blood tension was low and the pulse irregular. A high grade of acidosis was present. Magnesium sulphate was given intravenously, but the clinical picture changed rapidly to the nonresistant form with progressive asthenia, and the patient had a low, muttering delirium. Transfusion was performed on the ninth day. An immediate improvement followed, and the delirium cleared in six hours. The temperature dropped to normal in twenty-four hours and remained so. The patient was discharged on the sixteenth day in a very good state of convalescence.

CASE 3.—R. J. C., aged 27, in an apparently fair physical condition, entered the hospital, November 7, on the second day of his illness, with typical influenza. The temperature was 104.2. He was given sodium salicylate intravenously with resultant drop in temperature and clearing of the usual influenza symptoms. On the fourth day, cyanosis and pulmonary changes became evident. The temperature rose and clinical bronchopneumonia was well defined. The blood count remained between 2,500 and 3,000. A transfusion was performed on the sixth day, and the temperature dropped to subnormal in twenty-four hours, and remained slightly subnormal until the patient was discharged, in perfect convalescence, on the sixteenth day. The white blood count rose to 5,000.

CASE 4.—J. L., a slender boy, aged 17, entered the hospital on the third day of illness with typical influenza symptoms. The white cell count was 9,400. In twelve hours he developed more of a lobar type of pneumonia with faulty consolidation, marked intoxication and delirium. At the time of transfusion the temperature was 106; a twelve-hour drop to 100 and an increase of white cells to 12,750 were noted. A rise in temperature suggested another transfusion, which was followed by a slight reactionary rise to 106. The physical signs here were altered to a fixation of the process; the leukocyte count was 17,051. There was a crisis on the ninth day. An uneventful recovery followed, excepting a slight hematogenous icterus. The blood count returned to approximately normal after the crisis.

CASE 5.—W. M. A., a well developed man, aged 39, entered the hospital with typical influenza on the third day. He was given sodium salicylate intravenously without much apparent benefit. Increased cyanosis with acidosis and a progressive bronchopneumonic process indicated a transfusion, which was performed on the eighth day. There was a slight secondary reactionary rise next day, followed by an uneventful recovery. The patient was discharged on the seventeenth day.

CASE 6.—H. S., aged 19, anemic, slender and underdeveloped, entered with symptoms of influenza, minus the temperature, on the third day of illness. He was given quinin intravenously on the fourth day with no increase in white blood cells (3,600). Pneumonia developed on the fifth day. Transfusion was performed on the sixth day with a marked reaction. The temperature was 104.4 and rose to 107 in the axilla one hour after transfusion, accompanied by a very violent chill. After reaction, the temperature dropped by lysis. An uneventful convalescence followed. There was a slight secondary rise on the eleventh day when the patient attempted to get out of bed.

CASE 7.—R. McC., aged 28, of poor physical status, entered the hospital on the sixth day of illness, actively delirious, dyspneic, cyanotic, and with an axillary temperature of 104.2 Transfusion was performed on the seventh day of illness. The delirium and the general condition cleared somewhat. This patient was tremendously toxic; urinary chlorids were absent, and the blood count was 4,600. On account of the toxicity, an intravenous injection of sodium bicarbonate and sodium chlorid was given. There was some shock with this, as is shown by the rise in temperature, but the toxic state rapidly cleared. Resolution and an uneventful convalescence followed. The white blood count rose from 4,600 to 10,750 after transfusion. The patient was discharged on the twenty-first day.

CASE 8.—F. D. U., a boy of slender build and of poor physical condition, aged about 17, entered the hospital on the first day of illness with typical influenza. The whte cell count was 5,400. Sodium salicylate was given without effect. On the fourth day he was given magnesium sulphate intravenously. The white cell count was 3,250. The patient got out of bed on the morning of the sixth day. He developed a chill and a rise in temperature with pneumonia of the lobar type. Transfusion was performed on the eighth day with a temperature of 104; the patient was very toxic and cyanotic. There was difficulty in obtaining a donor, and the seriousness of the patient's condition made us use a donor whose red cells were found incompatible. The patient developed marked anaphylaxis, which was controlled by atropin. (The anaphylaxis had been anticipated.) The patient then developed a hematogenous jaundice. There was a clearing up of the physical state and a progressive rise in white blood cells to 22,000. He developed a secondary rash during convalescence. The period of convalescence was prolonged by gastro-enteritis. The patient was discharged well on the thirty-second day.

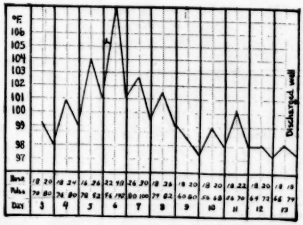

Fig. 4.—Clinical chart, Case 6.

CASE 9.—T. W. R., aged 37, a man of the dissipated type, entered the hospital on the third day of illness with typical influenza symptoms. He was markedly toxic, with albuminuria. The temperature was 103.2. The white cell count was 4,100. He developed bronchopneumonia with marked cyanosis and extreme delirium on the fifth day. Transfusion was performed on the sixth day without apparent effect, and again on the seventh day with decline by lysis and a clearing up of physical signs. The patient was discharged on the fourteenth day in perfect convalescence. The white cell count was 7,400. There was a report of pleurisy (?) after discharge from the hospital.

CASE 10.—A. A. T., aged 44, of heavy build and good physical condition, entered the hospital on the first day of illness

with typical influenza. He was given sodium salicylate intravenously with no apparent improvement. The white blood count was 6,850. Pneumonia developed on the third day, and transfusion was performed on the fourth day. The temperature dropped by lysis, and the symptoms cleared up on the seventh day. The patient was of marked nervous type with delirium. He was discharged convalescent on the twelfth day.

CASE 11.—C. T., aged 28, well developed, entered the hospital on the third day of illness with typical influenza symptoms. The white blood count was 2,150. The patient became extremely toxic and cyanotic with definite pneumonia on the sixth day. Transfusion was performed on the seventh day, resulting in a characteristic drop in temperature and a clearing up of the clinical picture. The white blood count was 7,700. The patient was discharged early on account of closure of the hospital. A recent report denotes perfect convalescence.

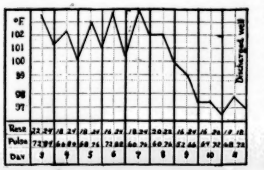

Fig. 5.—Clinical chart, Case 11.

CASE 12.—L. F. W., aged 33, obese, entered the hospital with typical pneumonia. He was cyanotic and extremely toxic. The temperature was 104, and respirations were 36, on the third day. The patient showed evidence of marked myocardial and renal insufficiency of long standing, augmented by the present condition. Albumin was ++++. The blood count was 7,950. Transfusion was performed on the fifth day of disease with apparent good result. On the seventh day, however, myocardial insufficiency progressed and the patient died with cardiac rather than the usual respiratory failure.

CASE 13.—E. V. R. entered the hospital on the first day of illness with typical influenza. He was in excellent physical condition with the exception of a low blood count, 3,500. Pneumonia developed on the third day. On account of inability to get donors, transfusion was not performed until the sixth day. The patient showed slight improvement but not permanent fixation. He was tremendously toxic, and the transfusion was repeated in twenty-four hours; but the patient became progressively worse and died on the ninth day. The terminal blood count was 2,900. We attribute this death to inability to transfuse in time. Clinically this patient was far better than Patient 14, a parallel case, at the time of entrance.

CASE 14.—C. H. entered the hospital with typical influenza on the first day of illness. The temperature was 104.4. Typical bronchopneumonia developed on the fifth day. Transfusion was performed on the seventh day. Uneventful recovery ensued. Temperature was normal on the ninth day. The white blood count increased from 3,150 to 7,740 after transfusion. The patient was discharged early on account of closure of hospital. A recent report states that he is in perfect health.

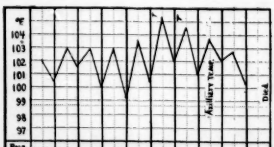

Fig. 6.—Clinical chart, Case 13.

CASE 15.—J. A. R., aged 30, of poor physical development, entered the hospital on the second day of illness with typical influenza. He was given sodium salicylate with no results. The white blood count of 5,900 dropped to 2,675. The patient developed a fulminant type of pneumonia, and transfusion was performed while he was moribund on the fifth day. He died on the sixth day.

CASE 16.—M. T., aged 41, of the dissipated type, entered the hospital with atypical influenza on the second day of illness. He was given sodium salicylate with no apparent effect. Double lobar pneumonia developed. The patient was extremely toxic and cyanosed, with low muttering delirium. Transfusion was performed while he was moribund. He died on the eighth day.

CASE 17.—B. D., aged 39, of poor physical condition and with a history of clinical syphilis, entered the hospital on the third day of illness with typical bronchopneumonia of the nonresistant type. He was actively delirious. Transfusion was performed on the seventh day of illness. The general status, including the delirium, became improved. However, the renal and hepatic insufficiency was of such a degree that elimination was practically nil. Despite the corrective efforts, the patient died on the tenth day. The initial white blood count was 4,150, but rose to 10,900 after transfusion.

CASE 18.—H. A. C., aged 43, well developed, entered the hospital with typical influenza symptoms. The white blood count was 2,400. Sodium salicylate was given intravenously on the second and third days with no effect. Pneumonia developed on the fifth day. Magnesium sulphate was given intravenously on the sixth day. The patient was extremely toxic and delirious. Transfusion was performed on the eighth day while the patient was moribund. He died on the tenth day.

CASE 19.—G. L. T., aged 42, of dissipated type, entered with typical influenza symptoms, apparently very toxic, on the eighth day of illness. He was given sodium salicylate intravenously with no effect, and this treatment was repeated on the eleventh day with no effect. The white blood count was 5,800. Bronchopneumonia developed on the twelfth day, and transfusion was performed on the fourteenth day. There was a resultant typical temperature curve, and a blood count of 15,000. Resolution developed, but the toxic state remained extreme. The patient was given alkaline transfusion on the nineteenth day, after which the toxemia gradually disappeared. He was discharged to convalescence on the twenty-sixth day.

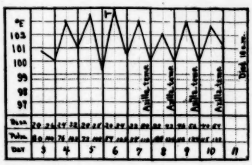

Fig. 7.—Clinical chart, Case 17.

CASE 20.—W. L., a well built man, aged 26, entered the hospital on the second day of illness with a temperature of 103, typical influenza, and a white cell count of 6,250. Sodium salicylate was given intravenously without much apparent result. Bronchopneumonia was diagnosed. The left side was chiefly involved on the fourth day of illness. Transfusion was performed on the fifth day. There was a slight secondary rise in temperature. The white cell count was 9,300, with a definite localization of the process. The temperature returned by pseudocrises to normal on the eighth day. Uneventful recovery followed, and the patient was discharged on the sixteenth day.

CASE 21.—C., aged 24, and in apparently good previous physical condition, was admitted on the second day of illness with typical influenza. A persistent high temperature, with a low blood count, 3,900, and definite bronchopneumonia indicated transfusion, which was performed on the fifth day. A slight secondary rise followed, succeeded immediately by improvement. The white cell count rose to 7,600. The convalescence was uneventful except for a slight rise due to follicular tonsillitis.

CASE 22.—W. R. B., a well developed man, aged 34, was admitted on the third day of illness with typical influenza symptoms. Expectant treatment was used. A rise in temperature on the seventh day with a recurrence of pain suggested the intravenous administration of sodium salicylate. After this, pneumonic signs and a persistent low white count persisted. A transfusion was performed on the ninth day. The temperature dropped to subnormal in thirty-six hours. The physical signs cleared and an uneventful recovery ensued. The patient was discharged on the sixteenth day.

CASE 23.—A. H., aged 29, a well developed man who had had apparently no previous physical disturbances of note,

entered very ill, November 1, having been ill one day. He appeared slightly cyanotic and dyspneic. Pneumonic complications were anticipated, though the chest signs were negative. The common symptoms, however, were present. Despite a favorable blood count, the pneumonic signs increased, and the clinical course became progressive; also the urinary chlorids were diminished, and general acidosis was marked. A transfusion was performed on the seventh day. The temperature dropped to that of a slightly delayed resolution type. The laboratory and clinical disturbances became restored to normal types on the fifteenth day.

CASE 24.—P. McK., aged 35, a well developed man of good physical status, entered on the second day of illness with typical influenza. He was given sodium salicylate with no apparent effect. Pneumonia developed on the fifth day. Transfusion was performed on the sixth day. Uneventful convalescence followed, and the patient was discharged on the thirteenth day.

CASE 25.—R. B., aged 20, a man of slender build, entered the hospital on the second day of illness with typical influenza. He was given sodium salicylate. There was a typical influenza curve of temperature. A secondary rise in temperature with diffuse bronchopneumonia was noted on the sixth day. Transfusion was performed on the seventh day with the resultant typical temperature drop and clearing of symptoms. The patient made an uneventful recovery except for slight otitis media. He was discharged on the sixteenth day.

CASE 26.—W. H. H., aged 32, well developed physically, presenting a case of toxic type and a white cell count of 5,000, entered the hospital on the second day of illness with typical influenza symptoms. He was given sodium salicylate with apparently good results. On the fourth and fifth days he was given 10 grains of quinin intravenously with no increase in the leukocyte count. Pneumonia developed on the fifth day, and transfusion was performed on the sixth day. The general status and white blood count were much improved, the white cell count reaching 12,900; but the high temperature continued. The temperature became normal on the tenth day, and an uneventful convalescence followed. The patient was discharged on the sixteenth day.

CASE 27.—A. J., aged 23, of slender, tuberculous type, entered on the first day of illness with typical influenza. Sodium salicylate was given without effect. The patient developed typical bronchopneumonia of the central type on the fifth day. The white blood count was 2,300. Transfusion was performed on the sixth day. The white blood count was from 4,950 to 9,000. There was a slight secondary rise with decline by lysis. Convalescence was interrupted by pleurisy of the plastic type on the seventeenth day. For four days there was high tem-

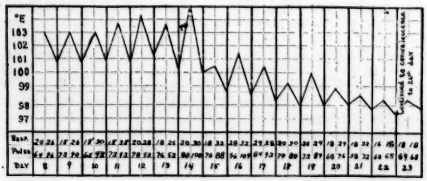

Fig. 8.—Clinical chart, Case 19.

perature. The patient was discharged convalescent on the twenty-fifth day.

CASE 28.—L. D., aged 21, a well built man, entered on the second day of illness with typical influenza symptoms. A typical diffuse bronchopneumonia became evident on the fifth day, and transfusion was performed on the sixth day. An initial drop and secondary rise followed with a resulting clearing up of disturbances. This patient was very toxic prior to transfusion, which condition cleared up early in convalescence. The patient was discharged on the fourteenth day of illness in perfect convalescence.

CONCLUSIONS

1. The cause of influenza is an intoxicant of unknown origin.

2. The clinical course and pathologic physiology indicate that this intoxicant acts primarily on the central nervous system, with especial reference to the medullary centers. Vasomotor paresis is a prominent and constant feature.

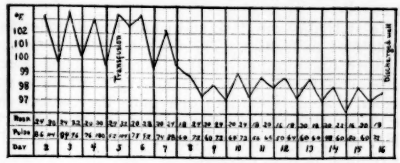

Fig. 9.—Clinical chart, Case 20.

3. Theoretical deductions and practical application affirm that a natural or an acquired immunity is corrective to influenza and its complications. Immune total blood transfusion is theoretically correct, and practical application has affirmed this.

4. The transfusion of total citrated immune blood with proper technic is a very simple and safe procedure.

5. The fulminant nature of the pneumonic complications of influenza demands the very early use of transfusion. Its use is of no avail if the reserve powers of nature have been allowed to progress to an incorrectable degree.

EPIDEMIC MENINGITIS AND DETECTION OF MENINGOCOCCUS CARRIERS*

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NEW YORK

Early after the mobilization of troops, epidemic cerebrospinal meningitis appeared. It was my opportunity to be stationed at one of the cantonments in an endemic area and later to be at the port of embarkation from which most of our troops were sent overseas.

The English had developed means for detecting carriers, but in this country the monograph of Flexner was used largely as the guide. The steps are:

1. Selection of those from whom cultures are to be taken.
2. Taking of cultures with the West tube.
3. Inoculation of veal glucose serum agar.
4. Selection of colonies.
5. Identification of organisms by:
   (*a*) Morphology in stained specimens.
   (*b*) Agglutination tests (polyvalent serum and normal horse serum).
   (*c*) If found to be meningococci, agglutination tests with the various monovalent type serums.

This system we tried to follow, and from it developed our methods. Oct. 16, 1917, we had our first case of meningitis. The laboratory was not equipped, and only Lieut. (now Major) O. F. Broman and I were ready to go to work. We made West tubes, poured plates, and went to the barracks from which the patient

* Because of lack of space, this article is abbreviated in THE JOURNAL by the omission of certain tables. The complete article appears in the author's reprints.

in the hospital had come. Here we learned that this man had been only one day with his present company, and having no special friends in the company, visited with most of the men. Furthermore, he had been in Company 62-164 D. B. until the day before. When we came to select contacts, we found that we had the company of more than 200 men of Company A, 354th Infantry, and the company of more than 200 men of Company 62-164 D. B., or more than 400 cultures in all to take.

We started at our task and completed it under the greatest of difficulties. The next day cases occurred in other organizations, and cultures of more companies had to be taken. In a very short time we decided that it is hard to determine the contacts in the Army, that friends do not sleep or sit near each other, and that carriers are found to be widely distributed in the company or even in the camp. On these matters we have the concrete data which bear out these assertions, and it is our opinion that to be of most value, companies must be examined for meningococcus carriers when a case occurs. It also developed that taking cultures with the West tube is not feasible or practicable. In place of West tubes we substituted at first only a few nasal swabs, gradually more, and finally we used altogether the nasal swab.

METHOD OF TAKING CULTURES

Thin cotton swabs on small diameter wooden applicators are prepared, and usually ten are sterilized in one test tube. To get the culture the nose is slightly pressed back by the tip, the mouth held open, and then the swab is carried back and downward, usually without touching the sides, clear to the posterior wall of the nasopharynx. Then the swab is rotated and again carefully withdrawn. The plate is inoculated directly with the swab unless there is much mucus, when a spreader is used. Before beginning to take cultures, the men in the company are lined up in two lines, the doors are locked, the windows are closed to get the air as quiet as possible, and a clerk on each side of the table takes the name of the soldier and gives him a number, which number also is used to indicate his culture on the agar plate. Usually the one clerk gives odd numbers and the other gives even numbers. The check list is marked to indicate the organization from which cultures are taken, and it is turned in to the clerk at the laboratory. The medium used at Fort Riley consisted

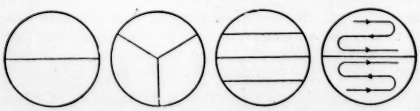

Fig. 1.—Division of plates into sections (*a*, *b* and *c*); method of making inoculation streak (*d*).

of the regular glucose veal serum agar as advocated by Lieutenant-Colonel Flexner. Later Huntoon's agar to which laked human blood is added to produce a slightly pink color was used and found to produce more and larger meningococcus colonies.

When possible, the plates are incubated over night in the inverted position before they are inoculated. As we did not have enough Petri dishes, at first we made cultures from two individuals, later from three, and at times from four on the same plate (of course, we preferred not to use less than one-half the area of a plate for each person from whom a culture was taken). The plate was divided into from two to four sections by marking on the bottom of the Petri dish with a wax pencil as is shown in Figure 1 *a*, *b* and *c*. The segment of the plate is inoculated directly with the swab, unless there is much mucus, when a spreader is used. The inoculation streak is made as is shown in Figure 1 *d* without rotating the swab. The segment is numbered to correspond to the soldier's number on the check list. The plates are kept warm and put in the incubator. The colonies are selected after from eighteen to twenty-four hours' incubation, the small translucent dew drop colonies being ringed with the wax pencil. When several colonies from one segment were selected, the colonies were lettered a, b, and so on. It was soon decided that unless none of the colonies could possibly be meningococci, the most meningococcus-like colonies should be ringed. Slides are then divided into ten spaces and numbered 0, 1, 2, 3 and so on. A drop of distilled

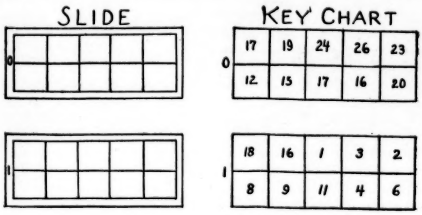

Fig. 2.—System of checking.

water is placed in each segment of the slide, and a key similarly ruled is made on paper; then as a portion of a colony is transferred to the center of a segment on the slide, the soldier's number is put in the corresponding square on the key chart. The plates from which colonies are placed on one slide are put up in one pile. The system may be explained by an illustration (Fig. 2).

After drying, the slides are fixed, and stained by Gram's method, with a counter stain of safranin or Bismarck brown, and the gram-negative diplococci noted.

After going through the plates of a whole organization, the worker has only the numbers of the probable meningococcus colonies to deal with. His list might read like this: 6, 21, 13, 190; and these he may have found on Slides 0, 2 and 18. Then the worker takes from Pile 0 the plate containing Colony 6, from Pile 2 the plate containing Colony 21, and so on. Slants of veal glucose blood agar or veal glucose hormone agar enriched with laked blood are inoculated from what remains of the colonies that are possibly meningococci. The tubes are incubated over night; but if the results must be given at once (that is, within twenty-four hours after taking the cultures), Krumwiede's slide agglutination method is used, that is, finely divided growth is added to polyvalent antimeningococcus serum and to normal horse serum as a control. The growth on the slant medium the next day is washed off in sterile salt solution and added to polyvalent antimeningococcus serum with a final dilution of 1:200, and to normal horse serum with a final dilution of 1:50. We really preferred diluting the serum properly and then mixing in carefully a portion of the agar growth. The tubes are then put in the 55 C. incubator for from four to six hours. If there is agglutination only in the polyvalent antimeningococcus serum, the gram-negative diplococcus is a meningococcus; but if there also is agglutination in the normal horse serum, it is not so regarded.

The technic is satisfactory but tiring. It is possible to train officers readily in the method. At Camp Funston and in the camps of the port of embarkation we had frequently to give results early; but it was regarded better to take out those suspected of harboring true meningococci than to wait until the second day for the absolute, final diagnosis. We may miss a portion of the carriers, but we certainly get those harboring any number of meningococci, and it is essential to remove all the infected men as soon as possible.

As time went on, more cases of meningitis developed at Camp Funston, the disease was occurring in new organizations, and it became evident that we must go still farther to check the disease. As we had been able to accomplish results in the control of meningitis in organizations from which cultures had been taken, it was decided to take cultures of the entire command, about 40,000 troops. This seemed impossible, but it was accomplished.

Six officers from the medical officers' training camp were selected as nasopharyngeal swabbers, nine officers were placed in the laboratory, and the enlisted men worked in day and night shifts. Whether the efforts were worth while and whether it is worth while to get carriers is to be judged from the results obtained and herewith tabulated.

EPIDEMIC MENINGITIS AT CAMP FUNSTON

The first case of meningitis occurred Oct. 16, 1917, in Company A, 354th Infantry. October 17, there were two cases in Company H, 353d Infantry, and one in Company B, 353d Infantry. The cases that occurred and the organizations involved are shown in Tables 1 and 2. In all there occurred, from October 16 to February 3, 148 cases in eighty-three organizations, and two cases in civilians. On the reservation there were at the outbreak of the disease about 50,000 troops in regular organizations of the 89th Division, the 164th Depot Brigade, 13th Cavalry and medical officers' training camp. October 15, there was a considerable interchange of soldiers, men being sent from the 89th Division to the 164th Depot Brigade and from the 164th Depot Brigade to the 89th Division, so that on the day before the first case occurred, men were sent to and from practically every organization in the camp. All of the men except those of the 13th Cavalry were from an area in which meningitis is endemic. In December, the 92d Division (colored) was filled up with men from various parts of the United States, and large numbers of men were sent to the medical officers' training camp. The cases of epidemic meningitis arranged according to months and organizations are shown in Table 1.

TABLE 1.—CLINICAL CASES OF EPIDEMIC MENINGITIS ARRANGED ACCORDING TO MONTHS AND ORGANIZATIONS

Month	89th Division	92d Division	M. O. T. C.	13th Cavalry	Civilians
October, 1917	15	..	..	1	2
November	75	..	..	0	0
December	30	4	1	0	2
January, 1918	12	5	4	..	0
February (3d inc.)	0	0	1	..	0
	132	9	6	1	4

TABLE 2.—CULTURES TAKEN FOR THE DETECTION OF CARRIERS, AND CARRIERS FOUND

Month	Cultures Taken	Carriers Number	Carriers Per Cent.
October (16 to 31 inc.)	4,712	136	2.8
November	11,337	532	4.7
December	37,435	1,152	3.1
January, 1918	48,695	1,470	3.0
	102,179	3,290	3.22

In the various organizations, 102,179 cultures were taken. To these must be added the cultures taken for the release of cases and carriers as well as whole wards and nurses and attendants in the hospital.

The cultures for the detection of meningococcus carriers were taken with the results given in Table 2.

Our culture work must be further divided, for we took cultures of organizations: (*a*) when a case occurred; (*b*) in the routine, and (*c*) when a large percentage of carriers was found in an organization. (The carriers were always removed from the organization and taken to a carrier camp. The workings of this will be shown farther on.)

The analysis of results is shown in Tables 3 and 4.

TABLE 3.—NUMBER OF CULTURES AND NUMBER AND PERCENTAGE OF CARRIERS FOUND WHEN MENINGITIS HAD OCCURRED IN AN ORGANIZATION AND ON ROUTINE CULTURE OF THE WHOLE CAMP

Month	After a Case: Cultures Taken	After a Case: Carriers No.	After a Case: Carriers Per Cent.	Routine: Cultures Taken	Routine: Carriers No.	Routine: Carriers Per Cent.
October, 1917	4,712	136	2.8	.....	...	...
November	6,817	258	3.77	2,358	108	4.58
December	2,391	114	4.76	25,711	798	3.10
January, 1918	2,140	91	4.25	38,700	1,268	3.27

TABLE 4.—NUMBER OF CULTURES AND NUMBER AND PERCENTAGE OF CARRIERS FOUND ON ORIGINAL AND RECULTURE IN ORGANIZATIONS IN WHICH A LARGE NUMBER OF CARRIERS WERE FOUND

Month	Cultures Taken: Original	Cultures Taken: Reculture	Carriers Number: Original	Carriers Number: Reculture	Carriers Per Cent: Original	Carriers Per Cent: Reculture
October, 1917	4,712	.....	136	...	2.8	....
November	2,192	2,138	122	52	5.61	2.43
December	1,974	1,928	196	76	9.93	3.99
January, 1918	137	129	10	5	7.29	3.87

These tables, based on a large number of cultures, show that generally the percentage of carriers was higher after a case than in the routine cultures. The first complete routine cultures disclosed 3.43 per cent. of carriers, while the second routine cultures on the same troops disclosed 3.02 per cent. A most interesting observation was obtained on reculture when a large percentage of carriers was found in the first culture. While in general less than one-half as many carriers were found, it many times happened that no carriers were found on the second culture. It must, of course, be remembered that the carriers were always removed from the organization. The effects on the epidemic of taking out carriers may be interpreted differently by different observers. For this reason the clinical cases as they occurred are shown according to date of occurrence and according to the organization in which they occurred. Clinical cases arranged according to date of occurrence are shown in Figure 3 and Table 5, and according to organization in Table 6.

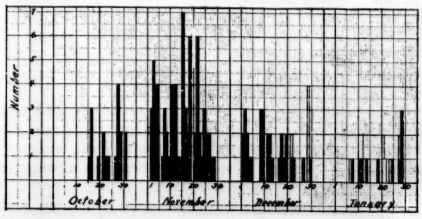

Fig. 3.—Number of cases and dates of occurrence of positive spinal fluid meningitis at Camp Funston, from Oct. 16, 1917, to Feb. 1, 1918: unshaded portion, cases occurring in newly recruited organizations (92d Division); shaded portion, cases occurring in original organizations (89th Division).

Of the 152 cases, four, or 2.6 per cent., occurred in officers, and no cases occurred among medical officers, nurses, or enlisted men in the wards. Four cases occurred in civilians, two being admitted to the hos-

pital in the first day of October, or about two weeks before any soldiers had the disease. There was no traceable connection between these first two civilian cases and the first cases occurring in soldiers.

From October 16 to February 3 is 171 days, and there occurred 150 cases of clinical epidemic meningitis. If this interval is divided into three parts of thirty-seven days each, we find that there occurred seventy-five cases in the first, forty-seven cases in the second, and thirty cases in the third thirty-seven days. But in the third thirty-seven day period only fourteen cases occurred in organizations that had been in camp the first and second thirty-seven day periods. The thirty-seven day periods correspond in the epidemic approximately as follows:

First thirty-seven days, before routine cultures were taken.

Second thirty-seven days, time of first complete routine cultures in the camp.

Third thirty-seven days, time of second complete routine cultures in the camp.

It may be objected that epidemics die out naturally; but in the third period, when new troops came in they came in gradually, so that cultures could be made, and there occurred only fifteen cases in approximately 15,000 troops, as compared to ninety cases in the 89th Division of about 40,000 troops from October 16 to December 1. But even if the spread and severity of the epidemic would usually have decreased, still by

TABLE 7.—PROTECTION AFFORDED BY CULTURES

	Cases of Spinal Fluid Meningitis			
	Total	In Carriers	Organizations Exposed	Per Cent. of Protection
1st 37 days	75	11	64 times	18.7
2d 37 days	47	2	45 times	4.44
3d 37 days	14	3	11 times	27.27

taking cultures of whole companies and the routine culture taking of the camp, another very important result was obtained. Sixteen of our carriers developed clinical meningitis, and five more developed sufficient clinical signs and symptoms to have lumbar puncture performed. Nine cases of meningitis with purulent spinal fluid developed in soldiers from whom cultures were taken and who were not detected as carriers; but in at least sixteen cases, by means of our cultures we decreased the probable spread of the disease. According to the thirty-seven day periods this may be presented as in Table 7.

This percentage of protection is a considerable one and indicates that taking cultures after cases and the routine taking of cultures of troops from endemic areas are of value. The development of meningitis in carriers will be discussed later.

Apparent benefits of taking cultures after cases and the routine taking of cultures of troops from endemic areas are demonstrated by these facts: (*a*) Sixteen of the thirty cases occurring from December 24 to February 3 were in newly recruited organizations. (*b*) Repeated cases of meningitis in an organization occurred almost entirely before December 1 (directly after the beginning of routine culture taking).

EPIDEMIC MENINGITIS AT THE PORT OF EMBARKATION, HOBOKEN, N. J.

Most of the troops sent to France, England and Italy were sent through this port. There are two embarkation camps, of which the one at Camp Mills has been under canvas, while at Camp Merritt barracks have been used. In addition to the camps, the Medical Department under Col. James M. Kennedy controls embarkation and debarkation hospitals (nine in number), two post hospitals, General Hospital No. 1 and such part of the Rockefeller Institute Hospital as is used for soldiers. The first case of meningitis occurred in September at Camp Mills. The occurrence in embarkation cases is given in Table 8.

TABLE 8.—CLINICAL CASES OF EPIDEMIC MENINGITIS AT THE PORT OF EMBARKATION, ARRANGED ACCORDING TO MONTHS

	Total	Camp Mills	Camp Merritt	Embarkation Hospitals
October, 1917	1	0	0	1
November	2	0	0	2
December	3	1	1	1
January, 1918	3	0	2	1
February	2	0	1	1
March	7	0	1	6
April	4	1	3	0
May	9	5	2	2
June	15	7	4	4
July	18	13	2	3
August	6	2	3	1
September	3	2	1	0
October	5	1	2	2
November	5	0	4	1
	83	32	26	25

The entire value of taking out the detected carriers cannot be determined, for until about May, 1918, the records of communicable diseases on the voyage overseas were not kept at this office, and the Surgeon-General's Office has no records available on this point. Since June, the ship's surgeon has provided the surgeon at the port of embarkation with a copy of the report delivered to the debarkation officers overseas, and from these reports we learn that two cases of meningitis occurred in organizations from which patients were taken out; but the men were gone from the camps before cultures could be taken. A number of cases occurred on the voyage in organizations from which no patients were taken during the stay in embarkation camps, but none occurred in organizations from which the carriers were removed. Three cases of meningitis occurred in carriers taken out on positive culture.

TABLE 9.—NUMBER OF CULTURES AND NUMBER AND PERCENTAGE OF CARRIERS FOUND WHEN MENINGITIS HAD OCCURRED IN THE PORT OF EMBARKATION

	Cultures Taken	Carriers Found	
		Number	Per Cent.
October, 1917	30	4	
November	0	0	
December	0	0	
January, 1918	333	16	4.8
February	230	13	5.6
March	156	20	12.8
April	634	17	2.6
May	701	11	1.5
June	1,623	38	2.3
July	1,191	27	2.2
August	463	7	1.5
September	5	0	0.0
October	208	1	0.4
November	459	4	0.9
Total	6,033	158	2.6

CARRIERS

Detection of carriers is of scientific and practical interest only so far as it effects the spread of the disease, as carriers develop the disease, and the manner of clearing up carriers. It is necessary to consider these points, especially as so many officers, without knowing a thing about it, have tried to discredit the value of detecting and removing carriers. That carriers spread the disease can hardly be doubted.

This is true from analogy to other diseases, such as diphtheria, and because taking out carriers certainly seems to have prevented the spread of the disease.

Detectable carriers must be divided into three groups: (*a*) those who are in the incubation period of the disease; (*b*) casual carriers, and (*c*) chronic carriers.

As was stated earlier, by our methods we probably detected the more heavily infected carriers. On those we detected we have considerable epidemiologic data to substantiate the assertion that our carriers were able to spread the disease; and that taking the carriers from the organization stopped the disease in that organization is evidenced by the following concrete cases, of which more could readily be added:

(*a*) In Company C, 356th Infantry, two cases occurred, Nov. 19, 1917, and two, Nov. 22, 1917. Cultures were taken, November 22, 25 and 29. The number of men from whom cultures were taken was 152, 157 and 129, and the number of carriers detected was 7, 9 and none, respectively.

(*b*) In Company A, 340th Field Artillery, 200 routine cultures were taken, November 22, and eleven carriers were detected. November 25, 150 recultures were taken and five carriers detected. November 30, 176 recultures were taken and no carriers detected. November 28 and December 3, two carriers taken out developed spinal fluid meningitis.

(*c*) In Company E, 353d Infantry, November 21 there occurred a case. November 22, 163 cultures were taken and no carriers found, and no further cases occurred in the company.

The development of the disease in carriers has been much discussed. Gates,[1] in his article on antimeningitis vaccinations, says, in his conclusions: "Moreover, agglutinins have been demonstrated in the blood serum of chronic carriers of the meningococcus. Evidence is thus brought forward that the relative immunity of chronic carriers to epidemic meningitis may be due to the presence of specific antibodies in the blood stream." This evidence we do not refute; but some of our detected carriers did have clinical meningitis with purulent spinal fluid. We made many examinations and many kinds of examinations, and from these believe that we have noted different varieties or degrees of epidemic meningitis:

1. Infection in the nasopharynx only or principally. These are our ordinary carriers.

2. Those having the clinical symptoms and signs of meningitis, but clear spinal fluid free from bacteria and polymorphonuclear cells. Five of our detected carriers had sufficient symptoms and signs to have lumbar puncture performed on them, and a very large percentage of our carriers early in the epidemic had severe headache, nausea and fever but cleared up shortly and lumbar puncture was not performed on them.

3. Those having clinical symptoms, clear spinal fluid and no increase in cells, but meningococci in the fluid. Of such cases we observed two: S., Company F, 354th Infantry, and R., Company C, 356th Infantry. That injection of the killed vaccine should, in at least a number of instances, produce severe headache, vomiting (projectile at times) and opisthotonos shows that the endotoxin has a predilection for the meninges, and it is possible that the toxin selects the meninges, injures them, and makes the field fertile for the meningococci already in the blood stream and gives rise to the frank epidemic meningitis with purulent spinal fluid.

4. Those having frank epidemic meningitis. Nineteen of our detected carriers developed the frank type of epidemic meningitis, one developed meningeal symptoms with meningococci in the fluid but no pus cells, and four others developed sufficient symptoms to have lumbar puncture performed. Nine cases of purulent spinal fluid meningitis developed in soldiers missed as carriers on cultures taken less than thirty days and more than seven days before the onset of the disease, and two soldiers missed as carriers in this way developed sufficient symptoms to have lumbar puncture performed. These data when further analyzed may be presented as in Table 10.

TABLE 10.—DEVELOPMENT OF EPIDEMIC MENINGITIS IN SOLDIERS WHOSE CULTURES HAD BEEN TAKEN

	Detected as Carriers		Missed as Carriers	
	Developed Meningitis with Purulent Spinal Fluid	Developed Clinical Meningitis, but No Purulent Spinal Fluid	Developed Meningitis with Purulent Spinal Fluid	Developed Clinical Meningitis, but No Purulent Spinal Fluid
Within 7 days or less after cultures were taken	19	5	4	2
More than 7 days after cultures were taken	0	0	5	0
Total	19	5	9	2

The incubation period lies between six and twelve days after exposure, so that it is evident that our detected carriers who developed meningitis (purulent spinal fluid and with sufficient clinical symptoms to have lumbar puncture done) were probably not carriers but early cases; and we have no evidence to prove that what are generally known as carriers (especially chronic) develop meningitis. Probably the five carriers who had sufficient clinical symptoms of meningitis had enough toxin to affect the meninges. At Camp Funston about 0.2 per cent. of the troops developed meningitis, while 0.48 per cent. of the detected carriers had the frank form of the disease, or the disease was more than twice as frequent in detected carriers as in all the troops coming from an area in which the disease is endemic. The disposition of carriers is an important factor. At first we sent detected carriers to the hospital; but later they were taken to detention camps where military drill could be continued, that is, the soldiers remained in training. At these detention camps at least once a day silver nitrate solution or argyrol was thoroughly applied to the tonsils and the nasopharynx. However, even without special treatment, about 90 per cent. cleared up very soon after they were taken from the active focus of infection; that is, at least 90 per cent. are only casual carriers. By February 1, out of 3,290 carriers at Camp Funston, only seventy-two, or 2.19 per cent., were found to be chronic carriers. These were all later cleared up by the laryngologists. At the port of embarkation about the same percentage of chronic carriers was hard to clear up as at Camp Funston.

SUMMARY AND CONCLUSIONS

1. Detection of carriers is possible and practical and has marked advantages over quarantining of contacts as has been generally practiced. Cultures of large numbers of troops can be taken with a high percentage of efficiency, and to get the best results it is necessary to take cultures of whole organizations rather than only contacts. The taking of cultures of large numbers of persons at one time has been necessary, and

1. Gates, F. L.: J. Exper. Med. **28**: 449 (Oct.) 1918.

at this time we are taking cultures for diphtheria bacilli of all sick and wounded returning from overseas (from 4,000 to 5,000 a week and up to 2,000 at a time) and getting results showing high efficiency of work on a massive basis. There is no evidence that the results on our large numbers of cultures were less accurate than were the results of other workers who took cultures of only a few at a time. In fact, we got better results when we were hard pushed then when we had less work, for when there was much to do the officers were more keen.

2. The taking of cultures of whole organizations or even entire camps need not interfere with military training; taking out the carriers and putting them in a carrier camp interferes less than quarantining even only the contacts.

3. Detecting and taking the carriers out of organizations is of value, and the routine taking of cultures of the whole command seems indicated if the troops come from areas where epidemic meningitis is endemic.

4. Detected carriers have the disease, but our data seem to show that those that developed the disease were already in the incubation period when the cultures were taken. We have no evidence that chronic carriers developed the disease.

5. The cotton swab on a straight wooden applicator, the cultures being taken from the nasopharynx through the nose, gave us good results, and its use is much more feasible than the West tube and bent wire applicators when cultures of large numbers of troops are to be taken.

Sixth Avenue and Eighteenth Street.

THE PATHOLOGIC ANATOMY OF INFLUENZAL BRONCHOPNEUMONIA *

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In this report, based on approximately 200 necropsies, no attempt will be made to distinguish between changes due to the unknown virus and those from mixed or secondary infection; only the most outstanding features are discussed.

Perhaps the most lasting impression from long association with lobar pneumonia in postmortem examination is that when it alone is responsible for death, with very few exceptions,[1] a considerable part of the total pulmonary parenchyma is consolidated, undistensible and heavier than normal; even when limited to one upper lobe, that lobe is as a rule huge, and the lung weight as a consequence frequently doubled.

Therefore, the first feature of the lungs in influenza to attract attention was the relatively small amount of lung tissue solid with grossly demonstrable pneumonia. Even when measured, the total of such regions is so small that it is difficult to ascribe death to the pneumonia with an assurance at all comparable to that with which death is accounted for by lobar pneumonia; in fact, the amount of lung tissue in influenza actually pneumonic seems too little in many cases to explain death by pneumonia. This is best shown by distending the lungs with air, for many of the dark red or purple places, apparently airless and semisolid, balloon out and become quite pink. When surfaces are made by cutting tissues actually pneumonic from influenza, it is not common to find gray or gray-red and finely granular plugs of fibrin and cellular exudate which come away on the knife, as is the case in lobar pneumonia and most bronchopneumonias other than those of the influenzal type. Such surfaces in the nondistensible places in influenzal pneumonia are wet, "velvety" and not granular, but smooth; they resemble raw meat or wet skeletal muscle. The redness of the button-like, firm, superficial regions of pneumonia, likened by some observers[2] to hemorrhagic infarcts, is due perhaps as much to the well-preserved cells of the exudate, many of which are mononuclear, as to the blood content.

However, ranking in importance with the relatively small amount of actually pneumonic lung, or perhaps entitled to first place as a conspicuous feature, is the huge, often thin and watery bloody exudate in the lung tissue and bronchioles. This bloody fluid, on the development of rigor mortis, often pours out of the nostrils so as to stain a large part of the white sheets in which bodies are wrapped. It mainly is responsible for the low level to which the lungs sink when put into water and for the total submersion of some; many are like the lungs of the drowned. The fluid mixed with air and forming a blood-tinged froth is abundant in the trachea, larynx and large air passages after death. Accumulating under the visceral pleura, it makes one of the most interesting and tell-tale signs of influenza; for normally the pleura, fitting the underlying lung tissue snugly as a transparent membrane, allows every detail of the coal-dust mosaic-like markings, as well as the coarser details of the pink, air-containing vesicles, to be clearly seen; but, with the presence of this bloody fluid in the subpleural lymph vessels in abundance so as to distend them, there are produced opaque, reddish brown places, usually a few centimeters in diameter, frequently seen at once when the sternum and costal cartilages are removed. They are so distinctive that influenza is at once suggested as the cause for death; and when no clinical details are known, are highly important clues as to the cause of death. This dissection of the outermost layers of the pleura is very common in the angles formed by fissural surfaces—in the bottom of the cleft. Small hemorrhages in the pleura are also common.

Another feature also due to this bloody exudate is that usually there is some fluid of the kind just described in one or both pleural cavities—more, as a rule, on the side of greater lung involvement. Now, with most pneumonias the pleural exudates are not so blood tinged. With lobar pneumonia they are not only commonly yellowish but also heavy with fibrin; large masses of yellow fibrin wet with plasma often make the lung in lobar pneumonia actually "shaggy"; this I have not seen in influenza. There is commonly some fibrin on the lung, but search is often necessary to find it. It is seldom more than 1 mm. thick, and is often less. The amount of the blood-tinged fluid in the pleural cavities varies widely. When measured, from 25 to 100 c.c. are frequent; larger amounts have been weighed, and the following weights will serve as examples of these exceptional instances: fluid in the

* From the Pathological Laboratory, Rush Medical College.

1. Compare report by Clark and Batman (J. Infect. Dis. 1: 229, 1904) on capillary bronchiolitis, with the symptoms of lobar pneumonia including a crisis.

2. Abstracts of Foreign Literature Compiled by the British Medical Research Committee, J. A. M. A. 71: 1575 (Nov. 9) 1918.

right pleural cavity, 840, 345, 860, 600, 320, 930 and 600 gm., each one case; fluid in the left pleural cavity, 900, 1,000 and 320 gm., each one case; 660 gm. in the right with 800 gm. in the left; 1,120 gm. in the right with 1,140 gm. in the left, each one case. These large collections of fluid are in no sense "empyemas." The fluid is only slightly turbid. When time has elapsed for sedimentation after death, the fluid taken for bacteriologic examination, if the pipets are not introduced too deeply, is quite transparent and clear, often with a little of the lilac tint of hemolysis; that collected from deeper layers is turbid.

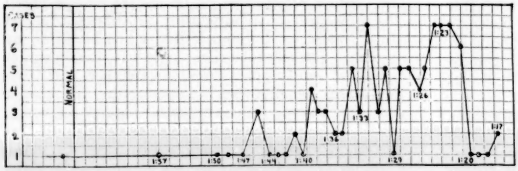

Chart 1.—Ratios of lung weight to body weight in 103 cases of lobar pneumonia from necropsies in 1915 and 1916.

This bloody exudate is not pus in the sense that pus is the product of liquefaction necrosis; there is no suppuration. Postinfluenzal empyema, however, does occur, as well as empyema with repeated thoracentesis. This thin, characteristic, bloody exudate of influenza contains only a little fibrin; or none at all may be visible grossly. It is unlike the pleural exudate of any other form of acute pneumonia with which I am familiar. It reminds one most of the inflammatory exudates in such places as the arm from acute sepsis following wound infection, or the thin, bloody fluid of woody phlegmon of the neck; it is more like exudates due to streptococcus than those we are familiar with in pneumococcus inflammations. The fat of the thymic body and other mediastinal fat, as well as all of the tracheobronchial lymph glands, are also often thoroughly wet with this fluid.

Since so much fluid was found in the lungs and as part of an exudate which in many instances escaped into the pleural cavity, less because of pleuritis there than because the lungs, so to speak, "overflowed," the lung weights were compared with the weights of lungs in lobar pneumonia. This comparison is shown by the accompanying charts of the ratio of lung to body weight.[3] From the charts it is apparent that the ratio of lung weight to body weight in lobar pneumonia and influenza are roughly similar; whereas with lobar pneumonia, the precipitate of fibrin is considerable, other parts of the pulmonary parenchyma being compensatorily emphysematous, in influenza, the pneumonia is less and the increased weight due in large part to fluid.

The pneumonia of influenza is commonly referred to as bronchopneumonia. It may be so designated, but it differs from other bronchopneumonias in its predilection for the periphery of the lungs and in the extent to which the inflammation is hemorrhagic.[4] These features, as well as the relatively little consolidation, are well shown by the following account, which may be taken as fairly typical of conditions found with death early in the disease:

The upper lobe of the right lung is easily ballooned out with air, likewise the middle lobe, so that the black places due to coal dust are very black, the intervening lung tissue pale gray or pink. Except for a place 4 by 2 cm. on the mesial surface of the upper lobe where fibrous adhesions were torn, the pleura is smooth. There are two solid places in the back of the upper lobe, and the pleura covering them is a little swollen. These are 3 by 4 by 5 cm., not at all sharply outlined, with moist gray plugs (hand lens) in the air sacs which cut so as to leave smooth wet surfaces; a thin, watery red fluid comes out of the minute bronchioles in them. The lung tissue around them is very wet but contains air; their bronchi contain a thin fluid with opaque flocculent masses in it. Another similar solid place near the front margin of this upper lobe, 5 to 6 cm. in diameter and 1 cm. from the pleura, has a good deal of blood in it. A solid place is in the back of the lower lobe, like the others but with a layer of fibrin on the pleura over it, as thin as transparent paper. This is also very superficial, and the bronchus to it is full of a frothy, thin, red fluid. A fifth place, from 5 to 6 cm. in diameter, less sharply outlined, with thin fibrin on its pleura and 2 cm. deep (the third dimension), is in the lower lobe near the diaphragmatic surface, which is about one-third covered by fibrin. All the bronchi to this lobe contain these flocculent masses, some adherent to the lining. In the depths of this lobe about the large bronchi there is some consolidation 1 to 2 cm. wide, sharply outlined and deep red. Except in these solid places this lobe distends easily with air, as does the middle lobe, which has no solid places.

The pleura of the left lung is smooth, and both lobes distend completely with air except in two solid places 2 to 4 cm. in diameter, one in the front of the upper lobe and 1 cm. deep, dark red and apparently full of blood, the other in the lower lobe and in all essentials similar. The first of these has sharp margins at lobule septums, and the pleura covering it is raised and translucent. In the smaller bronchioles of the left lung there is a little creamy mucopus.

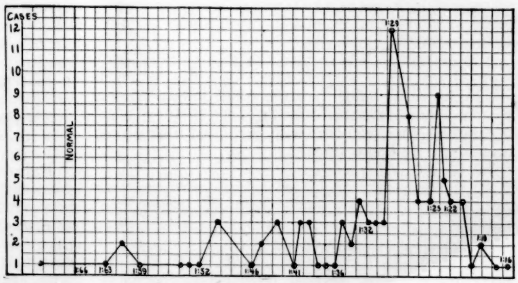

Chart 2.—Ratios of lung weight to body weight in 100 cases of influenzal pneumonia.

There was a little slightly turbid bloody fluid in each pleural cavity.

Next in importance as a characteristic of this disseminated pneumonia, hemorrhagic in its early stages

3. The normal line is the 1.5 per cent. of the body weight, or 1:66, as given by Vierordt (Anatomische, physiologische und physikalische Daten und Tabellen, Ed. 3, 1906, p. 44).

4. Symmers, in consequence of the hemorrhages, has compared influenzal pneumonia to that of pneumonic plague (J. A. M. A. 71: 1482 [No. 2] 1918).

and phlegmonous later, is the change in the medium-sized and smaller bronchioles to the involved lung tissue. Early their linings are simply red, their channels filled with a thin, blood-stained froth or fluid; later the linings are necrotic and their content either a thin mucopus resembling that of early gonorrhea or such a mucopus with small flocculent gray or gray-brown masses in it; slight dilatation of the smaller bronchi is common.

The brain substance is quite regularly swollen, the convolutions of the cerebrum flat; and although this may be evident at once by examining the head first, it is also very well shown by comparing segments made by coronal sections of influenzal brains after hardening in formaldehyd with other brains similarly treated; they are not so swollen as are the brains of septic abortion or other forms of generalized streptococcus infection, nor so pale; but the even external contour and narrowness of the lateral ventricles is a conspicuous feature of influenza; this edema of the brain substance is less than that of uremia or heat stroke.[5]

Still another feature of influenza is that the spleen is not so large as in lobar pneumonia. This statement is a general one and is made without reference to the stage of either disease. The kidneys are regularly the seat of cloudy swelling, and have tense capsules. If any gross alteration of the liver deserves mention as fairly constant, it is the presence of patches of yellow on the front surface due to superficial fatty change.

Less constant are generalized icterus; the early appearance of staining of the lining of large blood vessels by laked blood; patches of necrosis of the larynx or trachea lining; hyperplasia of the lymphoid tissues of the thorax and neck; slight acute serofibrinous pericarditis; acute interstitial emphysema of the lungs and mediastinal tissues, or of these with subcutaneous tissues as well; otitis or accessory (nasal) sinus inflammation, or actual suppuration as small abscesses in the lungs.

It is difficult to believe that a disease with so many distinctive features and affording, as it has, so much of novelty in pathologic anatomy can fail to possess a correspondingly definite etiology.

A more complete report with results of microscopic studies will be made later.

1748 West Harrison Street.

5. McKenzie, Pierce, and LeCount, E. R.: Heat Stroke, with a Second Study of Cerebral Edema, J. A. M. A. **71**: 260 (July 27) 1918.

Children in the Connecticut Courts.—Prior to 1917, Connecticut had no special laws governing the trial of children. They were subject to the same legal processes as adults. A law passed in 1917, provides that no child under 14 shall be committed to a jail or common lockup while awaiting trial. In a report on the subject named, prepared by Prof. William B. Bailey of Yale University for the National Children's Bureau, the need for better care of dependent and delinquent children in Connecticut is brought out. Mental examinations to determine the mental condition of delinquent children are rarely had, and repeaters are numerous, until it is determined by a mental examination that such children are feebleminded. In New Haven 692 children were brought before the courts in 1914 and 1915, of whom 672 were boys; most of them for trivial offenses, the most serious being that of a boy of 6 for burglary. The report points out that one fourth of the children brought before the courts in New Haven were from families which had at one time received aid from the associated charities, though the connection between poverty and delinquency is difficult to establish.

THE DIAGNOSIS OF MITRAL STENOSIS

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Mitral stenosis has not been generally regarded as a common valvular lesion. In the examination of 25,813 soldiers, mitral stenosis was diagnosed in 0.56 per cent., while the diagnosis of mitral regurgitation was made in only 0.43 per cent. In a previous communication, the strict criteria used in diagnosing mitral regurgitation were recorded.[1]

The definite recognition of mitral stenosis is based on the presence of a presystolic or diastolic, apical murmur[2] with or without other classical signs or symptoms. The characteristic type of heart's action is a physical sign of paramount importance. In well-marked cases, when there is hypertrophy, the almost ringing first sound, the accentuated second pulmonic, the small pulse and symptoms, the diagnosis is simple. However, in examining young adults from 21 to 31 sent to the various camps by the local boards, these obvious cases are weeded out. There remains a certain number of cases with no symptoms and no cardiac hypertrophy. The latter group requires very careful study. As a class these men are remarkably free from symptoms, and resent not being allowed the privilege of serving. The pulse rate is slow, the response to exercise usually excellent. The diagnosis rests purely on the presence of a presystolic murmur.

The relationship of a history of acute articular rheumatism in these cases was investigated. In 168 cases we obtained a definite history of rheumatic fever in sixty, or 39.1 per cent. From the remainder, histories of sore throats, scarlet fever, pneumonia, smallpox and other infections were obtained.

In order to obtain some comparative figures, 100 normal recruits were questioned for a history of sore throats. Ninety-five gave a definite history and forty-six of such severity as to confine them to bed. By a comparison of statistics, it was impossible to determine a relationship between previous infection and endocarditis. It is obviously unsound, after determining that a patient has mitral stenosis and has had tonsillitis, to say that the tonsillitis is the cause of the endocarditis.

The recognition of the murmur of mitral stenosis in these early cases requires careful study and examination. It has not been my experience that I have been able to diagnose mitral stenosis after exercise that I have not suspected before exercise. It is true, however, that it has been suspected in far more cases than it has been proved, especially in the recruits with tachycardia. In a recruit with a slow-acting heart, with a snappy or split first sound and a ringing second, unless the soldier is exercised, cases will be overlooked. It is necessary to auscultate in the upright as well as in the reclining posture. It is often of service to have the soldier reclining and well over on his left side in order clearly to bring out the murmur. The variability of the murmur is surprising. It may be heard in any posture, usually best in the reclining. In one instance,

1. Rothschild, Marcus A.: The Diagnosis of Mitral Regurgitation (Valvulitis), J. A. M. A. **72**: 327 (Feb. 1) 1919.

2. The so-called Flint murmur occasionally heard in aortic insufficiency must be differentiated. This differentiation is a matter of extreme difficulty and is based purely on the personal equation. It is my opinion that a presystolic murmur heard in a definite case of aortic insufficiency would better be regarded as evidence of mitral stenosis when there is a definite history of acute articular rheumatism.

it could not be distinguished with a pulse under 100, but was well audible with a pulse over 100.

There is, however, a group of cases which I have termed, for lack of a better name, "feeling cases of mitral stenosis." In this group, there is no definite mitral stenotic murmur, but a peculiar ringing or split first sound and an accentuated pulmonic second. Two competent examiners will differ as to the exact diagnosis, one saying the soldier has early mitral stenosis, the other "feeling" he will have it. It is in this group that Morrison's amyl nitrite test is of service. The inhalation of amyl nitrite will definitely bring out a presystolic murmur in some of these cases and in others clear up the first sound. In this group, amyl nitrite inhalations are more valuable than the exercise test. The presence or absence of a thrill is of little value because of the danger of confusion of the presystolic thrill of mitral stenosis with the systolic thrill found so frequently in the overacting heart (the neurocirculatory asthenia complex). This condition has been very frequently confused with that of mitral stenosis. The differential diagnosis should not be difficult. In the early case of mitral stenosis there are none of the peripheral manifestations of neurocirculatory asthenia, the cold, cyanotic extremities, the sweating, etc. In the functional cases there are tachycardia, a poor exercise response, marked liability of the heart's action, frequently a change of rate from 120 to 90 from the upright to the reclining posture, and equally labile blood pressure. In the functional case there is a suggestion of a thrill, a snappy first sound with or without a systolic murmur, and an accentuated pulmonic second sound. Exercising these soldiers has given little assistance in differentiating this condition from mitral stenosis, so far as auscultatory phenomena are concerned. In this group, it is important to auscultate during a period of slow heart action. To obtain this we have employed ocular-pupillary pressure with the soldier in the reclining posture. If an assistant exerts sufficient pressure on both eyes, while one is auscultating the apex, the heart will generally gradually decrease in rate from 120 to 60, the first sound will become clear, and the thrill will disappear. When the same reflex is tried in cases of mitral stenosis, the murmur remains unchanged or is accentuated.

It is not possible to demonstrate cardiac hypertrophy in the majority of these early cases, either by location of the apex beat or by percussion. Electrocardiographic studies on ventricular predominance would be of interest.

The lack of subjective complaints in this group is a matter of great interest. Valuable information could be obtained by following a small group of these soldiers through a period of years. Our knowledge of fully developed disease pictures is becoming fairly replete. However, our knowledge of early disease is still scant. More interest should be taken in this wide field of medicine.

CONCLUSIONS

1. Mitral stenosis is not an uncommon valvular disease in men between 21 and 31.

2. Only 40 per cent. of our cases gave a definite history of acute articular rheumatism.

3. The early cases require careful examination, as the murmur is variable.

4. The presence or absence of a thrill is of little value.

5. It must be differentiated from the overacting heart (the neurocirculatory asthenia complex).

6. Ocular-pupillary pressure has proved of great service in differentiating the two conditions.

7. Morrison's amyl nitrite test is of value in proving the diagnosis in cases in which there are slow acting hearts.

New and Nonofficial Remedies

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION. W. A. PUCKNER, SECRETARY.

TANNIN ALBUMINATE EXSICCATED-MERCK.—A compound of tannic acid and albumin, thoroughly exsiccated, and containing about 50 per cent. tannic acid in combination. It was first introduced as tannalbin.

Actions and Uses.—Tannin albuminate exsiccated is astringent. Its use is based on the assumption that the tannin would pass the stomach largely unchanged and thus the astringent action be exercised in the intestine where the compound would be decomposed by the intestinal fluid. It is not likely to produce gastric disturbance. It is used in diarrhea, particularly in that of children and in phthisis.

Dosage.—From 1 to 4 Gm. (15 to 60 grains) in powder or tablets followed by water. For infants the dose is from 0.3 to 0.5 Gm. (5 to 8 grains) in gruel or other mucilaginous liquids.

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Tannin albuminate exsiccated is prepared by precipitating 10 parts of a 10 per cent. solution of egg albumin with 6.5 parts of a 10 per cent. solution of tannic acid, washing the precipitate with water until the washings react only faintly to ferric chloride, drying it on porous tiles, powdering and heating the product to about 125 C. for six hours.

Tannin albuminate exsiccated is a light brown, odorless, tasteless powder, containing about 50 per cent. of tannic acid. It is practically insoluble in water or alcohol, but slowly soluble in alkaline fluids, which decompose it into its constituents.

Shake 0.1 Gm. of tannin albuminate exsiccated for one-half minute with 10 Cc. of water and filter. To the filtrate add one drop of ferric chloride test solution. Only a slight blue coloration is produced (*tannic acid*).

Incinerate 0.5 Gm. tannin albuminate exsiccated. Not more than 0.2 per cent. of ash remains.

Necessity for Attention to Mental Hygiene.—The United States Census Bureau shows that in 1910 there were 187,791 persons in hospitals for the insane and 20,731 persons in institutions for the feebleminded, and that the aggregate cost to the country of the insane alone is more than $160,000,000. On the basis of the lowest estimate there are two insane and four feebleminded persons in every 1,000 of the general population of the United States. Field investigations by officers of the United States Public Health Service indicate that in schoolchildren the ratio of feebleminded will average eight per thousand. Medical examinations of registrants in the first selective draft showed that out of each 1,000 men examined 24 were rejected on account of nervous or mental disorders, and still others developed such disorders under stress of military training and warfare. Many of the dependent and criminal population suffer from some type of mental disorder, either acquired or hereditary. Of 84,198 persons confined in almshouses in 1910, at least 42,000 had some form of mental alienation; of the 136,472 persons in prisons, jails, work houses and institutions for juvenile delinquents, at least 30,000 were mentally diseased. On the foregoing showing it is said in *Public Health Reports*, Jan. 17, 1917, it is high time for physicians and health officers to take an active interest in mental disease as a public health problem.

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SATURDAY, MARCH 1, 1919

THE CONTRIBUTION OF HOLIDAYS TO NATIONAL VIGOR

The revolutionary changes that the necessities of the war have injected into our national habits and conventional practices have already become the subject of much speculation with respect to their future states. One often hears the query: "Shall we ever return to our former ways?" Particularly true is this in relation to the educational system, notably among the higher institutions of learning, which have responded in a most extraordinary manner to the nation's call for young men trained intensively in special ways to meet war-time emergencies. There has arisen a concentration of effort and a speeding up of schedules utterly unprecedented in the history of such establishments.

We should not be understood to imply that the outcome of this new way of conducting the business of education necessarily represents a beneficent reform. Undertaken to meet an emergency, it has demonstrated the capacity of our institutions to undergo rapid changes and adjustments of plan and policy. Even before any critical evaluation of the results achieved and the possible advantages gained can be attempted, we hear the prophet declaring that this country shall never again revive the slow and easy methods of the past. The catchword "efficiency" is made to work overtime as the keynote of the expected performances of the future. We are warned that the mistakes of the past must not be repeated; that concentration of attention and conservation of the precious days and years are to become standard aims in the reconstruction period, alike in the world of education and in the domain of commerce.

More than one who have observed the actual working out of the new "militarized" procedures in practice have seriously asked themselves whether in the long run such war-time measures can secure peace-time benefactions. The fact that every hour of the day is utilized does not guarantee that it is most advantageously employed. There is such a thing as intellectual indigestion resulting from inordinate concentration. The efficiency of a mechanical or automatic performance can doubtless be increased in large measure by persistently continued practice; on the other hand, there are more distinctly intellectual processes which become impaired unless a reasonable period for reflection and mental recuperation is allowed.

Let us hesitate, therefore, lest we adopt a machine-like scheme too rashly as the basis for the further development of American higher education. The physician has a special concern in the threatened abolition of the institution of holidays. To him who watches the mode of life of his fellow citizens, the beneficence of an occasional holiday has not escaped notice. It need not be debated whether there has been inordinate waste of time in the past; whether the life of many of our citizens, young and old, has not been extravagant in authorized idleness. The institution of suitable holiday periods is for the most part more than likely to make for good. "The right use of a holiday is one of the sovereign secrets in the practice of the noble art of keeping alive." Let us bear this in mind in the discussion of the projects of reconstruction, frankly admitting that leisure is valuable in the long run only if it improves the quality of work. A change of work may become a holiday in essence. The best holiday is not one spent in languid idleness but one that contains the largest amount of new experience. The physician needs such holidays; and in selecting their routine he will do well to observe such holiday experts as the naturalist, the traveler and the historian, rather than the golfer. A holiday, said a capable observer, is not an end in itself, but a means to a general improvement of the working life. The test of whether a holiday has or has not been well used, he added, is the supplement of zest and vigor that it contributes to our proper labors.

FOOD AND BACTERIA—THE NEW BROMATHERAPY

Alimentary bacteriology is in that interesting evolutionary stage when the light of investigation discloses a new picture of possibilities almost as often as it is turned on the subject. One of the newly discovered situations has been presented in an address to the Philadelphia Pathological Society by Professor Kendall[1] of the Northwestern University Medical School:

> The belief that the intestinal flora is fundamentally a physiologic unit rather than a heterogeneous collection of adventitious microbes has afforded opportunity for a new avenue of approach to this complex subject. Viewed from this angle, the kaleidoscopic aggregation of micro-organisms which comprise the normal intestinal flora stands in a rather definite relation to the diet of the host. That is to say, as the diet is changed along definite lines a dual bacterial response may be elicited. The types of bacteria may and frequently do shift. Those organisms which cannot accommodate themselves to the new nutritive environment tend to diminish in numbers, and other, more adaptable, types take their place. A less spectacular but frequently more signifi-

1. Kendall, A. I.: Recent Developments in Intestinal Bacteriology, Am. J. M. Sc., **156**: 157, 1918.

cant response is that in which the products of the metabolic activity of the intestinal microbe change parallel with the nutritional stimulus.

There is something decidedly hopeful in the knowledge that of the many varieties of micro-organisms gaining entrance into the alimentary tract few succeed in establishing themselves. The proof that the intestinal tract may become a veritable graveyard for ingested bacteria must spur us on to discover the mechanism whereby the survival is prevented. Foremost doubtless is the fact that most bacterial species have definite rather than promiscuous food requirements or, at least, preferences. Every one knows, broadly speaking, that whereas sugar is readily attacked by yeast it is not so readily decomposed by bacteria. This is a familiar illustration of microbiotic preferences. Contrary to a widespread belief, the bacterial flora of the alimentary tract is by no means a replica of that of the food we eat. The diet of early infancy is rich in carbohydrate in the form of lactose. The *Bacillus bifidus* then establishes itself in the intestine. As the diet changes with age the colon group of bacteria begins to assert itself, not because coliform organisms dominate in the diet but because they, above all others, thrive as well in a medium from which carbohydrates are absent as in one containing them.

The upshot of what has just been intimated is that no implantation of bacteria in the alimentary tract can be expected to prove permanent unless the diet affords a suitable pabulum for the maintenance of the varieties introduced. The remarkable dietary adjustability of the coliform group serves to explain why it is represented to the extent of nearly 60 per cent. of the viable fecal flora. Bromatology and bromatherapy, the science and art of employing food in suitable ways, find a new field in securing intestinal conditions that will lead definite bacterial groups to survive or perish, even in definite regions of the bowel.

Prolonged changes of diet may do more than change the types of surviving intestinal bacteria. Kendall points out that products arising from the utilization of food for energy by intestinal bacteria are of paramount importance in determining the specificity of action of these microbes. To a limited degree a careful modification of the diet may materially alter the character of these metabolic products, with benefit to the host. In the case of the diphtheria bacillus the cultures in suitable carbohydrate contain no toxin, whereas those cultivated under parallel conditions in mediums without carbohydrate are likely to produce considerable amounts of very potent toxin. In the light of such an illustration is it too much to imagine that the flooding of the digestive canal with appropriate foods might be made to reduce radically the alimentary toxicity of adventitiously implanted pathogenic organisms? The carbohydrate-preferring bacteria of the duodenum differ from those of the lower bowel because their favorite food is still available in the upper reaches of the gastro-intestinal tract. To perpetuate the same, perhaps beneficent, types elsewhere calls for insurance of carbohydrate in the lower portions. How this can be accomplished is a problem of the new bromatherapy. As Kendall remarks, intelligent bacterial implantation presupposes an accurate knowledge of the chemistry of the metabolic products of the bacteria under varying dietary conditions. More knowledge is certain to initiate helpful advances in therapy.

A SIDE LIGHT ON THE PROBLEM OF PERNICIOUS ANEMIA

The genesis of pernicious anemia is assuredly still sufficiently obscure to warrant the consideration of it from every promising aspect. The dictum that the hemolysis which is continually taking place in this disease does not differ in kind from that occurring normally or in certain other disorders, but only in degree, gives emphasis to the significant behavior of the blood cells, without affording a new clue to the possible hemolytic agent. Why does hematogenesis become insufficient to replace the lost corpuscles? What is the origin of the poison—the materies morbi which either acts as a hemolytic agent or as a cause of injury to the hematopoietic organs or both?

An interesting suggestion has lately come from the field of comparative pathology. Among horses there occurs a widespread form of anemia which has been associated with the occurrence of larvae of the fly *Oestrus equi* as parasites in the walls of the stomach.[1] The malady is identical with that familiar to French veterinarians as anémie infectieuse. Seyderhelm,[2] working in Strassburg, has demonstrated that injected extracts of the larvae in question can be made to produce a series of symptoms characteristic of the severer types of anemia. The important observation, however, is that although the larvae contain substances that are hemolytic toward red blood corpuscles in vitro, they also yield extracts that can be purified so as to be free from such directly hemolytic agents, yet highly efficacious in producing characteristic symptoms of severe anemia when the product is introduced into the body.

This raises anew the debated question as to whether the actually potent etiologic factor in pernicious anemia is a hemolytic poison or whether the anemia is a consequence of less direct reactions of the causative agent.

1. Seyderhelm, K. R., and Seyderhelm, R.: Die Ursache der perniziösen Anämie der Pferde, Arch. f. exper. Pathol. u. Pharmakol. **76**: 149; Wesen, Ursache und Therapie der perniziösen Anämie der Pferde, Arch. f. wissensch. u. prakt. Tierheilkunde **41**: 1914; Experimentelle Untersuchungen über die Ursache der perniziösen Anämie der Pferde, Berl. tierärztl. Wchnschr., 1914, No. 34. Seyderhelm, R.: XVII Tagung der Deutsch. path. Gesellsch., 1914.

2. Seyderhelm, R.: Ueber die Eigenschaften und Wirkung des Oestrius und seine Beziehung zur perniziösen Anämie der Pferde, Arch. f. exper. Path. u. Pharmakol. **82**: 253, 1918.

It has frequently been suggested that the anemia produced by the intestinal parasite *Bothriocephalus* and closely resembling the classic "pernicious" anemia is attributable to a hemolytic lipoid shown to be present in the animal; but objection has been raised to the identification of hemolytic lipoids as the sole cause of blood destruction in the severe anemias, for the organism is well equipped with antagonists to such lipoids. The case of the fly larvae has furnished the highly significant fact that whereas the hemolytic lipoids obtained from them fail to produce any serious illness after introduction into the body, the nonhemolytic fractions of larval substance are exceedingly potent. However promising the lipoid hypothesis has been in the attempt to elucidate the genesis of pernicious anemia, it must no longer be allowed to overshadow consideration of other hypothetic specific poisons, whether they are assumed to be of intestinal, metabolic or entirely extraneous origin.

MALT PREPARATIONS AND CALCIUM METABOLISM IN INFANCY

Malt preparations have enjoyed considerable popularity for some time in the feeding of infants. One of the familiar mixtures is the so-called malt soup, the use of which was modified by Keller of the University Clinic for Children at Breslau to include potassium carbonate. Various claims have been made for seemingly empiric combinations. The assimilability of the malt sugar has been highly lauded, though the evidence for this alleged superiority over other available carbohydrates is by no means overwhelming, however probable it may seem on theoretical grounds. Maltose has been vaguely stated to be indicated in the constipation of infancy. In actual feeding practice, good gains of weight have often been reported as attending the use of Keller's formulas, and the further assertion has been made that the retention of calcium so essential to the growth of the skeleton is thereby facilitated.

How little has been determined definitely regarding the utilization and metabolism of calcium in infancy becomes apparent from the study of the recent controversial literature on the subject.[1] Hence we may be prepared for debated statements with respect to the possible rôle of malt preparations aside from their value as sources of simple carbohydrates. Dubois and Stolte[2] attributed the favorable effect of Keller's malt soup on calcium retention to the alkali that it contains. They argued that the latter contributes to the neutralization of the acids formed in metabolism and thus prevents the loss of calcium for this purpose.

In experiments on animals, Givens and Mendel[3] at Yale University failed to find that administration of a base like sodium carbonate produced any significant effect on the balance of calcium. More recently, Sato[4] has reported from the Department of Pediatrics of Johns Hopkins University that in a normal infant the addition of alkali to milk produces not only no favorable effect on the retention of calcium but a distinctly unfavorable one.

According to Sato, however, malt extract alone without alkali acts beneficially on calcium storage. If malt soup has a favorable effect on calcium metabolism, it is not as a result of the alkali originally contained in it or added to it. Malt extract to which a considerable amount of alkali has been added seems to have a rather unfavorable influence on the calcium balance. There is at present no reason to attribute the seemingly substantiated benefit of malt preparations on calcium storage to the malt sugar per se. It must be remembered that malt extracts are somewhat heterogeneous in composition. And the statement of Bosworth and Bowditch[5] of Boston that ingestion and absorption of unduly large amounts of calcium salts may under certain conditions of inadvisable feeding promote toxic results in infancy indicates how far we are from final conclusions as to the rationale of the subject.

Current Comment

THE CREATININ CONTENT OF THE BLOOD AS A PROGNOSTIC INDEX IN NEPHRITIS

The improvements introduced in recent years into the methods of analyzing small quantities of blood have made it possible to obtain more exact knowledge regarding many of the chemical changes attending important diseases. Our readers are presumably familiar with the innovations that have contributed to a better understanding in respect to both diagnosis and prognosis in such instances as diabetes, gout, nephritis and uremia. The methods of blood analysis are taking their place side by side with other procedures, such as the phenolsulphonephthalein and related tests, for ascertaining the functional excretory capacity of the kidneys. The damaged eliminating power of these organs seems to be manifested first of all by an increase in the uric acid content of the blood. A greater renal insufficiency is exhibited when there is unmistakable retention of urea. Creatinin is the last of the familiar nonprotein nitrogenous constituents to show accumulation in the blood. In other words,

1. Holt, L. E.; Courtney, A. M., and Fales, H. L.: Is the Amount of Calcium Usually Given in Dilutions of Cow's Milk Injurious to Infants? Am. J. Dis. Child., **16**: 52 (July) 1918. Bosworth, A. W.; Bowditch, H. I., and Giblin, L. A.: Ibid. **16**: 265 (Oct.) 1918. Bosworth, A. W., and Bowditch, H. I.: High Protein Feeding Versus High Calcium Absorption as the Cause of the Increase of the Body Temperature of Infants, ibid. **16**: 279 (Nov.) 1918.

2. Dubois, M., and Stolte, K.: Jahrb. f. Kinderh. **77**: 21, 1913.

3. Givens, M. H., and Mendel, L. B.: Studies in Calcium and Magnesium Metabolism, I, The Effects of Base and Acid, J. Biol. Chem. **31**: 421, 1917.

4. Sato, Akira: The Effect of Alkali and Malt Preparations on the Retention of Calcium in Infancy, Am. J. Dis. Child. **16**: 293 (Nov.) 1918.

5. Bosworth, A. W., and Bowditch, H. I.: Studies of Infant Feeding, XI, High Protein Feeding Versus High Calcium Absorption as the Cause of Increase in Body Temperature of Infants, Am. J. Dis. Child. **16**: 279 (Nov.) 1918.

creatinin appears to be the most readily eliminated of the commonly ascertained metabolites. Myers[1] and his co-workers at the New York Post-Graduate Medical School laboratories have argued that, theoretically, the amount of the increase of the creatinin in the blood should be a safer index of the decrease in the permeability of the kidneys than the urea for the reason that creatinin on a meat free diet is entirely endogenous in origin, and its formation (and elimination normally) very constant. Myers and Killian[2] appear to have furnished substantial clinical evidence for the belief that the kidneys are rarely able to overcome "the handicap of a high creatinin accumulation." Out of ninety-four cases of nephritis with blood creatinin values of 5 mg. or more per hundred c.c., improvement almost never followed, and early death was the usual outcome. On the other hand, patients with high figures for urea, but without marked creatinin retention, generally showed improvement. Hence the investigators, who have had exceptional opportunities to study the subject, employing methods that they have long practiced, came to the conclusion that the creatinin data gave them a better prognostic insight into doubtful cases than did either the blood urea figures or the more popular phenolsulphonephthalein tests, which were made simultaneously.

THE APPEARANCE OF LACTIC ACID IN ALKALOSIS

The responses of the organism to a condition of acidosis are becoming quite well known. In order to prevent the hydrogen-ion concentration of the blood from being materially increased, excess of acid radicals in the form of phosphates may be excreted by the kidneys, ammonia may be requisitioned to act as a neutralizing agent, or the alkali reserve of the blood plasma may be called on to combat the tendency to blood changes in the direction of greater acidity. Now that a reverse condition, that of alkalosis, has been described as an actual physiologic and clinical entity, it is natural to inquire as to the possible nature of the acid reserves available when the hydrogen-ion concentration for any reason tends to become less than normal. There is experimental reason for believing that less ammonia appears as an incident to acid neutralization. But according to recent observations by Macleod and Knapp[3] at the Western Reserve University School of Medicine, unoxidized acids, such as lactic acid, also are used for such adjustments in the organism. One might expect that when an excess of alkali is thrown into the blood it would be neutralized by carbon dioxid. The new studies indicate, however, that to prevent an accumulation of carbonates the organic acids may come into play. Thus injection of alkali causes lactic acid to appear in considerable quantity in the urine, and this may occur without any perceptible change in the hydrogen-ion concentration of the blood. The quantity of lactic acid recoverable during the period of alkali injection is insufficient to account for more than 5 or 6 per cent. of the administered alkali. Furthermore, alkali given by stomach in sufficient amounts to cause a disturbance in the acid-base equilibrium of the body, as evidenced by changes in hydrogen-ion concentration, in the ammonia excretion and in the titrable acidity of the urine, causes a slight increase in what is presumably lactic acid in the latter fluid. Evidently the protective devices of the body in such phenomena as the maintenance of the delicate acid-base equilibrium of the body are not yet recognized in their entirety.

1. Myers, V. C.; Fine, M. S., and Lough, W. G.: The Significance of the Uric Acid, Urea and Creatinin of the Blood in Nephritis, Arch. Int. Med. **17**: 570 (March) 1916. Myers, V. C., and Lough, W. G.: The Creatinin of the Blood in Nephritis: Its Diagnostic Value, ibid. **16**: 536 (Oct.) 1915.

2. Myers, V. C., and Killian, J. A.: The Prognostic Value of the Creatinin of the Blood in Nephritis, Proc. Soc. Exper. Biol. and Med. **16**: 41, 1918.

3. Macleod, J. J. R., and Knapp, H. J.: The Influence of Alkali Administration on the Urinary Excretion of Lactic Acid, and the Possible Significance of the Latter in Maintaining Neutrality in the Body, Am. J. Physiol. **47**: 189, 1918.

MEDICAL COOPERATION IN THE SELECTIVE SERVICE SYSTEM

The second report of the Provost Marshal-General to the Secretary of War covering the operations of the selective service system to Dec. 20, 1918, has just been made available. The interest physicians have taken in the work, and the service they have rendered in the various boards connected with the selective service system, gave assurance that much in this report would concern the medical profession. This prophecy is fulfilled. A few instances: Medicine is credited with supplying 4,246 of the 13,564 members of the local boards (31.3 per cent.); in addition, there were established 155 district boards on each of which there was at least one physician, and 1,319 medical advisory boards with a personnel of 9,577. The organized medical profession will appreciate the following statement:

> At this point a tribute is due to the American Medical Association. From this association came the suggestion for medical advisory boards and cordial assistance in their selection. THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, with a circulation of 66,000 copies, has been a valuable medium of information between this office and the medical men who discharged the duties of the profession to the government through the draft. The medical profession has responded and served in a devoted manner that has received universally favorable comment. It is gratifying to note the part which the Association has taken in thus assisting to raise our great army, as well as its valuable contribution to the war generally.

THE SUPPLY OF NURSES

In the Correspondence department of this issue are two letters relative to bills recently introduced in the legislature of Illinois to provide for the regulation of nursing. They discuss a question that is of national interest, as is evidenced by letters which have been published from Maine, Rhode Island and New Jersey, and also by radical legislation which has been introduced in Massachusetts. One need at least is clear—a greater supply of well educated nurses must be provided. No doubt a way will be found, without placing too severe a burden on either the nurses, physicians, hospitals or nurse training schools, to provide for the nursing needs of the public, which primarily is interested in the regulations that will be enacted.

Association News

THE ATLANTIC CITY SESSION

Announcement of Personnel of the Local Committee on Arrangements

The following Local Subcommittee on Arrangements for the Seventy-First Annual Session of the American Medical Association to be held in Atlantic City, June 9-13, has been announced: Emery Marvel, chairman; Henry T. Harvey, secretary; Edwin H. Harvey, treasurer.

CHAIRMEN OF SUBCOMMITTEES

Finance.....W. Blair Stewart
Entertainment.....C. Coulter Charlton
Section Entertainment.....Samuel Barbash
Hotels.....David B. Allman
Halls and Meeting Places.....W. J. Carrington
Section Meetings.....Byron G. Davis
Program.....Clarence L. Andrews
Printing.....Joseph Poland
Badges.....William W. Fox
Scientific Exhibit.....Samuel Stern
Registration.....David Berner
Information.....Milton S. Ireland
Alumni Entertainments.....Worth Clark
Post Office and Telephones....D. Ward Scanlan
Commercial Exhibit.....Isaac E. Leonard
Golf.....Walter Ponder Conaway
Women Physicians.....Clara K. Bartlett
Ladies' Committee.....Mrs. Gurney Williams

Medical Mobilization and the War

Personnel of the Medical Corps

For the week ending February 20, the Medical Corps contained 21,951 officers, a decrease from the previous week of 354. The Medical Reserve Corps contained 763 officers. The total number of medical officers discharged since the beginning of the war is 11,781.

Slightly Wounded

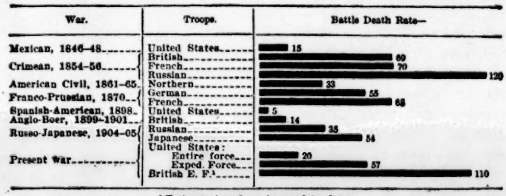
The following medical officers have been reported as having been slightly wounded: Richard S. Magee, Lieut., Altoona, Pa.; James P. H. Ruddy, Lieut., Scranton, Pa.; Fred A. Lieuallen, Capt., Portland, Ore.; Edward J. Meley, Lieut., Ludlow, Pa.; Ray H. Humphrey, Capt., Union, N. Y.; Emanuel Goldstein, Major, Brooklyn; William O. Kleinstuber, Lieut., Wilmington, Del.; Frank T. Duffy, Lieut., Charleston, Ill.; Frank Hurwitt, Capt., St. Louis; Thomas L. Doyle, Lieut., Tremont, Pa.; Alexander W. Seibert, Lieut., Washington, Mo.; William H. Sloan, Lieut., Garland, N. C.; George C. Skinner, Capt., Cedar Rapids, Iowa; William George Byrd, Capt., Belzoni, Miss.; Royal H. McCutcheon, Capt., Franklin, Va.; Raymond Lynde Wadhams, Capt., Wilkes-Barre, Pa.; Jerome Meyer, Lieut., Uniontown, Ala.; George M. Shewalter, Lieut., Indianapolis; Charles James Roach, Lieut., Zanesville, Ohio; Charles Edward McClelland, Major, Columbus, Ohio; John S. Rakin, Capt., Portland, Ore.; Joseph T. Brennan, Lieut., Vichy, Mo.

Wounded, Degree Undetermined

The following medical officers have been wounded (degree undetermined): Edgar W. Roberts, Capt., West New York, N. J.; William Bransford York, Lieut., St. Louis; Richard Sharpless Davis, Major, Germantown, Philadelphia; Renel A. Pierce, Lieut., Mass. N. G., Taunton, Mass.; Eli B. Moss, Capt., Chicago; Theodore L. Pulvermacher, Lieut., Brooklyn; Lawrence L. Keller, Lieut., McMinnville, Tenn.; Lloyd R. Mace, Lieut., Hollywood, Calif.; Arthur Blaine Gjellum, Capt., Brighton, Colo.; Samuel L. Ridge, Capt., Langhorne, Pa.; Albert Herman Hundermark, Lieut., Chicago; Israel Laurier, Lieut., Worcester, Mass.; William C. Stiff, Capt., Plymouth, Pa.; William V. Kane, Lieut., Lynn, Mass.; Henry K. Dillard, Capt., Philadelphia; Claude C. Lyon, Lieut., Logan, Ohio; Edwin Wilson Goodman, Capt., Jersey City, N. J.; Gustave E. Eck, Capt., Lake Mills, Wis.

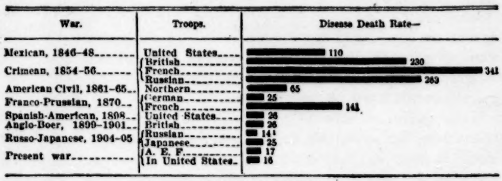
Death Rates in Disease and Battle

In his interview, published Saturday, February 15, in the *Official Bulletin*, General March calls attention to the report of disease and death rates issued by the statistics branch of the General Staff. The death rate from disease among our troops in this war was lower than in any previous war, and this is the first war in which the United States has been engaged in which fewer men were lost from disease than from battle. The low disease rate is attributed in part to the inoculation of troops against certain diseases. Had it not been for the influenza epidemic, the rate would, of course, have been much lower. In the total forces the battle death rate was 20 per thousand per year; the rate of the Expeditionary Forces alone is 57 per thousand per year, which is one half of the annual death rate in the British Expeditionary Forces. The accompanying charts, taken from the Official Bulletin of February 17, give further figures relative to comparative disease and battle death rates in the present and in previous wars.



[1] Estimate based on incomplete data.

Chart 1.—Battle death rates per thousand per year in recent wars. Accurate strength figures for previous wars are difficult to obtain. In most cases the rates given are probably based on total forces under arms. In this and the accompanying charts, the source of information has been: Comparative mortality of Disease and Battle Casualties (Seaman Prize Essay), Capt. L. C. Duncan, M. C., U. S. Army; G-1, G. H. Q., A. E. F.; Statistical Division, A. G. O., and Division of Sanitation, S. G. O.



[1] Based on doubtful data.

Chart 2.—Disease death rates per thousand per year in recent wars.

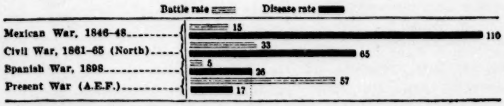


Chart 3.—United States battle and disease death rates per thousand per year.

Prisoners Released

The following officers reported as prisoners have been released from the German prison camp: E. J. Presper, Capt., Philadelphia.

HONORABLE DISCHARGES, MEDICAL CORPS, U. S. ARMY

NOTE.—In the following list, L. signifies lieutenant; C., captain; M., major; L. C., lieutenant-colonel; Col., colonel; and B. G., brigadier-general.

ALABAMA

Albany—Murray, M. W. (M.)
Birmingham—Prince, E. M. (C.)
Ensley—Tedder, C. E. (L.)
Sulligent—Hollis, D. L. (L.)

ARKANSAS

Elm Springs—Graves, H. W. (C.)
Hope—Smith, D. (L.)
Hot Springs—Strachan, J. B. (L.)
Marianna—Wall, E. D. (L.)
Mena—Hawkins, B. H. (C.)

CALIFORNIA

Ione—Robinson, C. A. (L.)
Lockeford—Priestley, W. F. (L.)
Los Angeles—Bonthius, F. A. (C.)
Oleander—Hardie, W. B. (L.)
Orland—Martin, D. L. (M.)
Palo Alto—Von Geldern, C. E. (L.)
San Francisco—Folte, A. G. (L.)
Read, J. M. (C.)

COLORADO

Denver—McKenzie, C. D. (C.)
Florence—Hutton, V. A. (C.)
Fort Morgan — Benawa, W. G. (L.)

CONNECTICUT

New Canaan—Bennett, E. S. (L.)
New Haven—Burke, W. P. (C.)
Foley, F. E. (L.)
Kiernan, E. C. (L.)
Waterbury—Farrell, J. E. (C.)

FLORIDA

Jacksonville—French, E. D. (L.)
St. Petersburg—Lambdin, L. (M.)

GEORGIA

Atlanta—Wood, E. B. (L.)
Hartwell—Barton, D. J. (L.)
Ray City—Rentz, L. S. (L.)
Thomasville — Little, A. D. H. (C.)
Tifton—Hendricks, W. H. (C.)
Zebulon—Hartley, J. M. (L.)

IDAHO

Sandpoint—McKinnon, M. (C.)
Winchester—Kelly, J. L. (C.)

ILLINOIS

Bloomington—Deneen, F. (L.)
Canton—Hays, T. C. (C.)
Cairo—Bondurant, F. (L.)
Chicago—Cornell, J. W. (C.)
Edison, S. M. (C.)
Garard, J. C. (L.)
Glover, C. W. (L.)
Logan, W. H. G. (Col.)
McLaughlin, J. W. (L.)
Rotman, D. B. (L.)
Sarginson, R. B. (L.)
Slavik, E. F. (L.)
Vaughan, R. T. (C.)
German Valley — Miller, P. M. (L.)
Granite City—Reuss, H. P. (L.)
Hebron—Bailey, C. W. (C.)
Rockford—Ackemann, H. W. (L.)
Walnut—Forney, G. V. (L.)

INDIANA

Brazil—Pell, H. M. (L.)
Converse—Brookie, R. W. (L.)
Craigsville—Somers, L. E. (L.)
Evansville—Hurst, W. R. (L.)
Indianapolis—Carter, J. C. (L.)
Lafayette—Clapper, M. M. (C.)
Waymansville—Maris, J. I. (L.)
Waynetown — Bounnell, H. M. (C.)

IOWA

Dubuque—Cantonwine, E. A. (C.)
Moes, M. J. (C.)
Fort Dodge—Chase, S. B. (L.)
Lake City—McVay, M. J. (L.)
Monticello—Stuhler, L. G. (L.)
Sioux City — Hagedorn, H. H. (L.)
Shuman, J. W. (M.)

KANSAS

Altoona—Kennedy, J. G. (C.)
Atchison—Brihach, E. J. (L.)
Burr Oak—O'Leary, A. J. (L.)
Coffeyville—Johnson, E. W. (L.)
Topeka—Stewart, R. B. (C.)

KENTUCKY

Buechel—Rush, W. M. (C.)
Cynthiana—Morgan, J. F. (L.)
Lexington — Pohlmeyer, H. F. (L.)
Louisville—McKenna, H. J. (C.)
Owensboro—Griffin, R. E. (C.)
Shelbyville—Lawrence, G. (C.)
Sorgho—Filiatreau, R. N. (L.)
Valley View—Bailey, N. A. (L.)
Washington—Berry, I. (L.)
Worthville—Driskell, E. B. (L.)

LOUISIANA

Bunkie—Martinez, R. D. (L.)
Derry—Hankins, W. N. (L.)
La Fayette—Daley, O. P. (L.)
New Orleans—Babin, A. J. (L.)
Rayne—Webb, R. C. (L.)

MASSACHUSETTS

Boston—Ellsworth, S. W. (M.)
Greenwood, A. (L. C.)
Scannell, D. D. (M.)
East Northfield—Philbrick, R. H. (L.)
Leominster—Grady, J. E. (L.)
Lynn—O'Keefe, E. S. (L.)
Marblehead—Eveleth, S. C. (L.)
Springfield—Goodell, W. (C.)
Worcester—Ward, J. C. (L.)

MICHIGAN

Ann Arbor — Vaughan, V. C. (Col.)
Detroit—Clarke, D. M. (L.)
Monroe, J. D. (L.)
Frankfort—Doyle, C. P. (L.)
Galien—Snowden, R. H. (L.)
Holland—Boone, C. E. (L.)
Lansing—Miller, H. A. (L.)

MINNESOTA

Mankato—Liedloff, A. G. (M.)
Minneapolis—MacDonald, D. A. (L.)
Mann, A. T. (M.)
Montevideo—Lima, L. R. (L.)
Rochester—Clark, C. M. (L.)
Moore, A. B. (C.)

MISSISSIPPI

Charleston—Priddy, H. W. (L.)
Cleveland—McLean, E. R. (C.)
Meridian—Tate, M. (L.)
Touchstone, A. G. (L.)
Reid—Coley, S. W. (L.)
Ruleville—Pittman, C. J. (L.)
Vosburg—Walker, D. L. (C.)

MISSOURI

Kahoka—Johansen, F. A. (L.)
Kansas City—Hines, W. H. (L.)
Knox, A. C. (C.)
Maryville—Dean, L. E. (L.)
Milan—Porter, E. S. (C.)
St. Joseph—Bertram, C. W. (C.)
Minton, W. H. (C.)
Werner, C. H. (C.)
St. Louis—Davis, B. (L.)
Gayler, W. C. (C.)
Murphy, E. S. (L.)

MONTANA

Havre—Houtz, C. S. (L.)

NEBRASKA

Dawson—Fouts, R. W. (L.)
Omaha—Henry, W. P. (C.)
Wilsonville—DeMay, G. H. (L.)

NEW HAMPSHIRE

Dover—Goddard, F. C. (L.)
Exeter—Knowlton, J. G. W. (M.)
Manchester—Webber, N. B. (C.)

NEW JERSEY

Asbury—Moore, E. H. (L.)
Bloomfield—Thompson, P. B. (C.)
Brantwood—Fessler, W. (L.)
Newark—Woodhouse, A. (L.)
Penns Grove—Jarratt, R. B. (L.)
West New York—Coulter, L. M. (L.)

NEW YORK

Albany—Carmody, D. F. (L.)
Lyons, J. S. (L.)
Brooklyn—Harris, H. C. (L.)
Morrison, R. P. (L.)
Roth, A. (L.)
Sumner, I. E. (L.)
Buffalo—Buckley, P. H. J. (L.)
Kohlhas, J. J. (L.)
Plummer, W. W. (M.)
Freeport—Miller, W. G., Jr. (L.)
Hempstead—Combes, S. A., Jr. (L.)
Mohawk—Brooks, W. B. (C.)
Mount Vernon—Gebhard, K. (L.)
New York—Anderson, J. (L.)
Bingham, F. E. (L.)
Bondy, J. (L.)
Brody, S. (L.)
Derby, R. (L. C.)
Fuller, E. (C.)
Gilliam, D. B. (L.)
Grimley, J. G. J. (L.)
Harris, T. J. (L. C.)
Kulkin, S. (L.)
Kutisker, M. J. (L.)
Maloney, E. R. (L. C.)
McKernon, J. F. (Col.)
Muller, E. A. (C.)
Prioleau, P. (C.)
Schenectady—Faust, W. P. (M.)
Staten Island—Renwick, R. W. (L.)

NORTH CAROLINA

Salisbury—Rozzelle, J. H. (L.)
Tryon—Palmer, M. C. (C.)

NORTH DAKOTA

Williston—MacManus, F. W. (C.)

OHIO

Canton—Kramer, J. G. (L.)
Cleveland—Tippie, J. W. (C.)
Columbus—Edwards, J. C. (L.)
Gallipolis—Holzer, C. E. (L.)
Leetonia—Hennen, L. S. (L.)
Mansfield—Jelliffe, M. B. (L.)
Middletown—Bauer, E. O. (C.)
Mount Sterling—Wittich, R. B. (C.)
Rossford—Crossett, H. A. (L.)
Sycamore — Montgomery, C. W. (L.)
Toledo—Hammer, I. H. (C.)
Smead, L. F. (C.)
Ward, E. F. (L.)
West Alexandria—Hunter, A. C. (L.)
White House—DeVore, F. F. (L.)
Willard—McCreight, G. C. (L.)
Wilmington—Davis, J. I. (L.)

OKLAHOMA

Hominy—Mullins, I. (L.)
Oak Hill—Baird, W. G. (M.)
Oilton—Noah, J. H. (L.)
Picher—Williams, J. C. (L.)
Tulsa—Douglas, R. A. (L.)

OREGON

Portland—Sellwood, J. J. (M.)

PENNSYLVANIA

Gettysburg—Dickson, J. M. (L.)
Kennett Square—Schwegler, J. J. (L.)
Kittanning—Deemer, P. R. (L.)
Manheim—Guie, P. F. (C.)
Middletown—Swarr, O. H. (L.)
Mont Alto—Teplitz, M. M. (L.)
Philadelphia—Denney, G. H. (C.)
Schoonmaker, G. D. (L.)
Taylor, W. J. (L. C.)
Walker, H. (C.)
Pittsburgh—Barach, J. H. (C.)
Eyman, W. G. (C.)
Goldstein, H. R. (L.)
Milford, L. W. (L.)
Truschel, E. J. (L.)
Pottstown—Mauger, L. W. (L.)
Prosperity—Cary, J. H. (C.)
Reading—Leiser, W. 3d (L.)
Scranton—Sweeney, L. G. (L.)
Selinsgrove—Johnston, R. W. (L.)
Tarentum—Leydic, C. L. (C.)
Telford—Paulus, C. A. (L.)

RHODE ISLAND

Providence—Raia, J. E. (L.)

SOUTH CAROLINA

Charleston—Cathcart, R. S. (M.)

SOUTH DAKOTA

Canton—Parke, L. L. (L.)
Wessington—McKie, J. F. (C.)
Yankton—Hohf, S. M. (C.)

TENNESSEE

Ducktown—Hewson, W. J. (L.)
Memphis—Walker, H. L. (C.)
Nashville—Floyd, W. O. (C.)
Saint Elmo—Davis, M. D. (L.)

TEXAS

Beaumont—Pedigo, H. B. (C.)
Bonham—Kennedy, A. B. (M.)
Corsicana—Newton, E. H. (L.)
De Leon—Rush, H. P. (L.)
Lancaster—Wilson, J. E. (L.)
Mabank—Thomas, W. M. (L.)
McGregor—Blailock, H. F. (C.)
Mosheim — Blankenship, W. W. (L.)
San Antonio — Jackson, T. T. (M.)
Temple—Cook, T. E. (L.)
Vernon—King, T. A. (L.)
Waco—Brannon, E. C. (C.)

VERMONT

Burlington—Hunter, J. A. (L.)
Montpelier—Burr, C. H. (C.)
Rochester — Huntington, W. M. (L.)

VIRGINIA

Dorchester—Faust, G. T. (L.)
Lynchburg—Plunkett, F. O. (L.)
Richmond—Hagan, M. G. (L.)
Williamsburg — Jennings, C. W., Jr. (L.)

WASHINGTON

Olympia—Longaker, F. A. (L.)
Seattle—Bordsen, T. L. (L.)
Spokane — Schwabland, W. T. (L.)

WEST VIRGINIA

Charleston—MacQueen, G. A. (C.)
Paden City—Keifer, B. (C.)
Spencer—Dodson, R. (L.)
Weston—Burton, S. H. (C.)
Wheeling—Abersold, G. W. (L.)

WISCONSIN

Milwaukee—Fidler, C. A. (C.)
Ripon—Senn, C. U. (C.)

MEDICAL OFFICERS, U. S. NAVY, RELIEVED FROM ACTIVE DUTY

ALABAMA

Birmingham—Walsh, G. F.

CALIFORNIA

Los Angeles—Miller, F. W.
Richardson, W. W.
San Francisco—Cowan, J. F.
Galbraith, F. B.
Gilman, P. K.
Hewlett, A. W.
Santa Barbara—Brown, R.

CONNECTICUT

Bridgeport—Zoon, S. L.

FLORIDA

Tampa—Beyer, A. R.

ILLINOIS

Rock City—Butterfield, C. F. M.

MAINE

Fort Fairfield—Wyndham, C. A.
Machias—Larson, O. F.

MASSACHUSETTS

Boston—Applebaum, J.
Tully, G. L.
Holyoke—Cleary, R. E.
New Bedford—Clifford, R.
Provincetown—Curley, C. P.

MICHIGAN

Detroit—LaFerte, A. D.
Houghton—Malfraid, B. W.

MINNESOTA

Minneapolis—Anderson, E. D.

MISSOURI

St. Louis—Taylor, T. W.

NEVADA

Reno—Samuels, W. L.

NEW JERSEY

Atlantic City—Charlton, C. C.
Jersey City—Andreae, P. O. M.

NEW YORK

Brooklyn—Brinsmade, W. B.
Graham, J. C.
Lohman, W. H.
Long, J. H.
Rushmore, C. J.
Von Deylen, G. D.
Mount Vernon—Brown, R. H.

New York—Bainbridge, W. S.
Bassin, J. N.

OHIO

Defiance—Rieckhoff, F. A.

OKLAHOMA

Enid—Hinson, T. B.
Erick—Yarbrough, J. E.

PENNSYLVANIA

Philadelphia—Baldi, F. S.
Clay, J. V. F.
Gyles, R. C.
Harrison, F. G.
Hewson, W.
Jones, J. F. X.
Pittsburgh—Clark, N. H.
McCullough, J. F.
Weber, J. J.

SOUTH CAROLINA

Charleston—Framtpon, W. H.

TENNESSEE

Franklin—Walker, J. O.

TEXAS

Dallas—Millwee, R. H.
Houston—Clarke, J. E.

WISCONSIN

Milwaukee—Decker, H. G.

ORDERS TO OFFICERS OF THE MEDICAL CORPS, U. S. ARMY

Alabama

To Camp Sherman, Ohio, base hospital, from Hot Springs, Lieut. C. H. DRAKE, Birmingham.

To Fort Oglethorpe, from Camp Devens, Capt. J. H. EDMONSON, Birmingham.

Arkansas

To Arcadia, Fla., Carlstrom Field, from Lonoke, Lieut. D. R. WILSON, Fayetteville.

To Camp Pike, Ark., base hospital, from Camp Logan, Capt. J. E. CASHIN, Dierks.

California

To Camp Beauregard, La., from Camp Kearney, Major G. D. FRANCE.

To Camp Devens, Mass., base hospital, from Camp Meade, Lieut. D. E. SHEA, Los Angeles.

To Denver, Colo., from Vancouver Barracks, Capt. O. O. YOUNG, Whittier.

To Fort Douglas, Utah, from Camp Lewis, Capt. W. C. MABRY, Tropico.

To Fort McDowell, Calif., from Camp Kearney, Major C. M. HUNTER.

To San Francisco, Calif., from Camp Lee, Major A. J. WILKINSON, San Diego; Capts. M. H. ETCHEVERRY, San Francisco; G. S. HERBERT, Santa Paula. Letterman General Hospital, from Camp Dix, Capts. C. W. MACK, Livermore; S. BUNNELL, San Francisco; from the Surgeon-General's Office, Major W. B. BOWMAN, Los Angeles.

To Washington, D. C., and on completion *to San Francisco, Calif.,* Letterman General Hospital, from Camp Dix, Lieut.-Col. H. C. NAFFZIGER, San Francisco.

Canal Zone

To Philippine Department, from Camp Sheridan, Lieut. W. B. FOSTER, Jr., Ancon.

Colorado

To Fort McHenry, Md., from Fort Logan, Lieut. C. W. METZ, Denver.

To Fort McPherson, Ga., from Fort Bliss, Lieut. L. G. BROWN, Colorado Springs.

The following order has been revoked: *To Camp Gordon, Ga.,* base hospital, from Camp Sherman, Lieut. G. L. SHARP, Colorado Springs.

Connecticut

To Cape May, N. J., from Camp Dix, Lieut. H. G. JARVIS, Hartford.

To New Haven, Conn., from McClellan, Lieut. T. P. MURDOCK, Meriden.

District of Columbia

To Camp Upton, N. Y., from Fort Sill, Lieut. A. F. ROCHE, Washington.

To Hoboken, N. J., from Hot Springs, Capt. A. M. MacNAMEE, Washington.

To New Haven, Conn., from Camp Pike, Major A. G. COMPTON, Washington.

To the retired list, from San Francisco, Col. L. M. MAUS, Washington.

To Walter Reed General Hospital, D. C., from Camp Dix, Capt. J. D. THOMAS, Washington; from Hot Springs, Lieut. F. T. CHAMBERLIN, Washington.

Florida

To Camp Dix, N. J., base hospital, from Camp Jackson, Lieut. R. H. KNOWLTON, St. Petersburg.

To Hoboken, N. J., from Camp Dix, Capt. H. C. VON DAHM, Jacksonville.

Georgia

To Fort McHenry, Md., from Hot Springs, Lieut. M. BLANCHARD, Columbus.

The following order has been revoked: *To San Francisco, Calif.,* from Fort Oglethorpe, Capt. B. MASSEY.

Kansas

To Camp Jackson, S. C., base hospital, from Camp Greene, Major S. H. MARTIN, Cambridge.

To Fort Riley, base hospital, from Fort Des Moines, Lieut. A. LEUCYER, Aurora.

To San Francisco, Calif., as department surgeon, from Fort Riley, Col. E. B. FRICK.

Kentucky

To Camp Sherman, Ohio, to examine the command for cardiovascular diseases, from Camp Pike, Capt. C. D. MORRIS, Louisville.

To Fort McHenry, Md., from Hot Springs, Capt. J. H. HOHNSTEDT, Fort Thomas.

To Hoboken, N. J., from Camp Jackson, Lieut. A. D. ECHERT, Newport.

To Washington, D. C., from Fort Oglethorpe, Capt. G. F. DOYLE, Winchester.

Illinois

To Aberdeen, Md., from Camp Cody, Lieut. N. COPELAND, Chicago.

To Camp Abraham Eustis, Va., to examine the command for cardiovascular diseases, from Camp Pike, Capt. W. H. BURMEISTER, Chicago.

To Camp Custer, Mich., base hospital, from Camp Wadsworth, Lieut. M. J. KOSTREWSKI, Chicago.

To Camp Grant, Ill., base hospital, from Camp Dix, Lieut. C. S. BOWMAN, Alsey; from Camp Knox, Lieut. G. D. BRAND, Chicago.

To Camp Lewis, Wash., as tuberculosis examiner, from Vancouver Barracks, Lieut. V. MAURICAU, Rockton.

To Camp Sheridan, Ala., base hospital, from Hot Springs, Lieut. G. C. CONLIN, Springfield.

To Camp Travis, Texas, from Camp Cody, Lieut. P. D. LYONS, Chicago.

To Camp Wadsworth, S. C., base hospital, from Waynesville, Major W. H. WATTERSON, Chicago; Lieuts. W. S. NEEDHAM, Hanna City; J. L. ANDERSON, Winfield.

To Chicago, Ill., from Camp Dix, Major P. OLIVER, Chicago.

To Eastview, N. Y., from Camp Dix, Major R. M. RITCHEY, Elgin.

To Fort McHenry, Md., from Lakewood, Lieut. O. C. HYSLOP, Chicago.

To Fort Sheridan, Ill., from Camp Pike, Lieut. J. P. O'NEIL, Highland Park; from Camp Upton, Lieut. J. J. McCARTY, Jr., Chicago; from Rockefeller Institute, Lieut. R. A. BUCKNER, Gilman.

To Newport News, Va., as orthopedic surgeon, from Camp Sheridan, Lieut. R. E. DAVIES, Chicago.

To Oteen, N. C., from Waynesville, Major D. W. YOUNG, Paris.

To Philippine Department, from Camp Devens, Lieut. H. W. WATEROUS, Galva.

To Riverside, Calif., March Field, from Vancouver Barracks, Capt. C. L. STEALY, Freeport.

To Rockefeller Institute for instruction in the treatment of infected wounds, from Boston, Lieut. J. L. WEBB, Chicago.

To Whipple Barracks, Ariz., from Camp Beauregard, Capt. E. S. GILLESPIE, Wenona.

The following orders have been revoked: *To Fort Benjamin Harrison,* from Camp Custer, Capt. L. H. DAGGETT, Chicago. *To Fort McPherson, Ga.,* from Camp Wheeler, Lieut. J. W. MILLER, Chicago.

Indiana

To Fort Benjamin Harrison, Ind., from Fort Sheridan, Lieut. F. L. HOSMAN, Indianapolis.

To Fort McHenry, Md., from Hot Springs, Lieuts. E. O. DANIELS, Marion; C. G. MACKEY, Whiting.

To Fort Sam Houston, Texas, base hospital, from Camp Zachary Taylor, Lieut. C. E. QUINN, Burlington.

To Lakewood, N. J., from Camp Upton, Lieut. K. C. FITZGERALD, New Harmony.

To Pittsburgh, Pa., from Hot Springs, Lieut. F. KLEINMAN, Hebron.

To West Baden, Ind., from Lakewood, Capt. C. R. STRICKLAND, Indianapolis.

Iowa

To Camp A. A. Humphreys, Va., base hospital, from Hot Springs, Lieut. C. KAIL, Hartford.

To Camp Travis, Texas, base hospital, from Camp Cody, Capt. J. F. STUDEBAKER, Fort Dodge.

To Camp Wadsworth, S. C., base hospital, from Waynesville, Capt. S. C. BUCK, Grinnell.

Louisiana

To Fort McPherson, Ga., from Camp Dix, Capt. P. G. LA CROIX, Lieut. P. J. CARTER, New Orleans.

Maryland

To Camp Lee, Va., base hospital, from Hot Springs, Lieut. S. N. PILCHARD, Salisbury.

To Fort McHenry, Md., from Army Medical School, Major R. T. TAYLOR, Baltimore; from Hot Springs, Capt. T. R. PAYNE, Corbett.

Massachusetts

To Army Medical School, from Fort Oglethorpe, Capt. F. E. WHEATLEY, North Abington.

To Boston, Mass., from Camp Dix, Capt. D. MACOMBER, Newton; from Camp Jackson, Lieut. C. H. LAWRENCE, Jr., Boston.

To Camp Devens, Mass., from Camp Dix, Lieut. C. E. RODERICK, Boston. Base hospital, from Camp Dix, Majors P. E. TRUESDALE, Fall River; E. L. DAVIS, Springfield.

To Camp Dix, N. J., base hospital, from Camp Shelby, Lieut. J. H. TAYLOR, Boston.

To Camp Upton, N. Y., from Camp Meade, Capt. R. A. GREENE, Palmer.

To Colonia, N. J., from Army Medical School, Lieut. J. M. GILCREST, Springfield.

To Eastview, N. Y., from Camp Dix, Major J. HOMANS, Brookline.

To New Haven, Conn., from Camp McClellan, Lieut. H. ZIMMERMAN, Springfield.

To Oteen, N. C., from Camp Meade, Capt. G. E. EMERY, Worcester.

To Rockefeller Institute for instruction, and on completion *to his proper station,* from Colonia, Lieut. J. M. GILCREST, Springfield; from Fort McHenry, Capt. E. W. BURT, Westport.

Michigan

To Biltmore, N. C., from Waynesville, Capt. R. P. STARK, Allegan.

To Camp Grant, Ill., base hospital, from Camp Custer, Lieut. S. W. GREEN, Detroit.

To Fort McHenry, Md., from Camp Dix, Lieut. L. J. DRETZKA, Detroit.

The following order has been revoked: *To Fort Sam Houston, Texas,* base hospital, from Colonia, Major E. W. MAY, Detroit.

Minnesota

To Camp Meigs, D. C., to examine the command for nervous and mental diseases, from Camp Dix, Lieut. W. I. LILLIE, Rochester.

To Detroit, Mich., from Camp Dix, Lieut. E. J. ENGBERG, St. Paul.

To Fort McHenry, from Metuchen, Capt. J. W. LEE, Minneapolis.

To Fort Snelling, Minn., from Camp Dix, Capt. A. W. MORRISON, Minneapolis.

To New Haven, Conn., from Army Medical School, Lieut. J. K. ANDERSON, Minneapolis.
To Rockefeller Institute for instruction in the treatment of infected wounds, and on completion *to his proper station*, from Fort McHenry, Major A. R. COLVIN, St. Paul.
To Washington, D. C., from Rochester, Major E. S. JUDD, Rochester.

Mississippi

To Fort McPherson, Ga., from Camp Dix, Lieut. G. A. CALDWELL, Corinth.
To Newport News, Va., from Camp McClellan, Lieut. L. T. FERRELL, Murphy.

Missouri

To Camp Upton, N. Y., from Portland, Ore., Lieut. A. L. WESSLING, Martinsville.
To Camp Wadsworth, S. C., base hospital, from Waynesville, Lieut. E. J. BUTZKE, Bowling Green.
To Fort Porter, N. Y., from Camp Dix, Lieut. G. L. HARRINGTON, Independence.
To Jefferson Barracks, Mo., from Camp Dodge, Capt. A. LEVY, St. Louis.
To Pittsburgh, Pa., from Hot Springs, Capt. F. J. V. KREBS, St. Louis.
To Rockefeller Institute for instruction in the treatment of infected wounds, and on completion *to his proper station*, from Fort McHenry, Capt. H. E. HAPPEL, St. Louis.
To San Francisco, Calif., from Camp Lee, Capt. C. A. ROSE, Kansas City.

Montana

To Chicago, Ill., from Hot Springs, Lieut. J. E. ARNOLD, Miles City.

Nebraska

To Fort Des Moines, Iowa, from Camp Dix, Major E. C. HENRY, Omaha.
To West Point, N. Y., from Biltmore, Major F. J. WURTELE, North Platte.

New Hampshire

To San Francisco, Calif., from Walter Reed General Hospital, Capt. E. C. DURGIN, East Andover.

New Jersey

To Benicia, Calif., from Cape May, Lieut. A. W. SMITH.
To Biltmore, N. C., from Camp Logan, Capt. T. ALSOP, Atlantic City.
To Fort McHenry, Md., from Camp Hancock, Major G. C. ALBEE, South Orange.
To Fort Totten, N. Y., from Camp Devens, Capt. F. W. HUNTER, Fort Totten.
To Otisville, N. Y., from New Haven, Lieut. A. E. JAFFIN, Jersey City.
To Philadelphia, Pa., from Camp Dix, Lieut.-Col. J. C. McCOY, Paterson.

New Mexico

To Fort Bliss, Texas, base hospital, from Camp Cody, Capt. J. E. HASTINGS, Bernalillo.
To Mineola, N. Y., Hazelhurst Field, from San Antonio, Major W. MacLAKE, Silver City.

New York

To Camp Bragg, N. C., base hospital, from Camp Wadsworth, Capt. J. RAPHAEL, Brooklyn.
To Camp Meade, Md., base hospital, from Army Medical School, Major R. R. FITCH, Rochester.
To Camp Sherman, Ohio, base hospital, from Waynesville, Lieut. J. B. DEUEL, Rochester.
To Camp Wadsworth, S. C., base hospital, from Waynesville, Capts. C. A. NEWCOMB, Newark; E. P. EGLEE, New York.
To Detroit, Mich., from Rockefeller Institute, Lieut. C. W. DEMONG, Syracuse.
To Fort McHenry, Md., from Camp Holabird, Lieut. F. BARBER, Rochester; from Camp Jackson, Lieut. M. GLEICH, New York; from Hot Springs, Lieut. L. J. DeRUSSO, Albany.
To Fort McPherson, Ga., from Camp Dix, Lieut. F. J. AUWERS, Rochester.
To Fort Porter, N. Y., from Camp Meigs, Lieut. J. V. SWIERAT, Lancaster.
To Hoboken, N. J., from Camp A. A. Humphreys, Lieut. A. B. FERGUSON, New York.
To New Haven, Conn., from Army Medical School, Lieuts. R. E. CUMMING, New York; T. M. CALLADINE, Jr., Perry.
To Otisville, N. Y., from Camp McClellan, Capt. S. A. MAHADY, Utica.
To Pittsburgh, Pa., from Hot Springs, Lieut. J. J. MADDEN, Brooklyn.
To Walter Reed General Hospital, D. C., Capt. A. A. MOORE, New York; from Camp Lee, Lieut. J. W. McCHESNEY, Baldwin; from Camp Sherman, Lieut. F. A. SHARPE, New York; from Carlisle, Lieut. A. D. HAVERSTOCK, Brooklyn; from Fort McPherson, Capt. H. G. DUNHAM, New York; from Fort Oglethorpe, Capt. B. H. CAPLES, New York.
To Washington, D. C., Surgeon-General's Office, from Camp Dix, Col. E. L. KEYES, Forest Hills; from Camp Upton, Major D. W. WYNKOOP, Babylon.
To Williamsbridge, N. Y., from Camp Dix, Capt. L. E. GRIMBERG, New York.
The following order has been revoked: *To Camp Meade, Md.*, base hospital, from Cape May, Capt. J. HORNI, Brooklyn.

North Dakota

To Washington, D. C., Surgeon-General's Office, and on completion *to Fort Snelling, Minn.*, from Camp Dix, Lieut.-Col. E. P. QUAIN, Bismarck.

Ohio

To Camp Dix, N. J., base hospital, from Camp Pike, Major A. S. McCLAIN, Lakewood.
To Camp Grant, Ill., base hospital, from Camp Cody, Capt. W. F. MILLHON, Columbus; Lieut. M. H. SHIPLEY, Cleveland.
To Camp Meade, Md., base hospital, Lieut. M. E. HARRELL, Woodstock.
To Camp Sherman, Ohio, base hospital, from Waynesville, Capt. A. C. BARTHOLOMEW, Van Wert.
To Fort Bliss, Texas, base hospital, from Camp Grant, Lieut. H. K. BECKWITH, Toledo.
To Fort McHenry, Md., from Camp Jackson, Lieut. C. J. ALTMAIER, Marion.
To Fort Sheridan, Ill., from Camp Dix, Capt. J. A. CALDWELL, Cincinnati; from West Baden, Capt. H. H. FISHER, Columbus.
To Hoboken, N. J., from Camp Devens, Major J. M. DAY, Waynesfield.
To New Haven, Conn., from Army Medical School, Lieut. I. B. SMOCK, Canton.
To Newport News, Va., as orthopedic surgeon, from Boston, Lieut. L. W. KRAUSS, Cleveland.
To Philadelphia, Pa., from Camp Zachary Taylor, Capt. A. CROTTI, Columbus.
To Pittsburgh, Pa., from Hot Springs, Lieut. J. F. BEERMAN, Toledo.
To Walter Reed General Hospital, D. C., from Camp Sherman, Capt. J. K. TRESSEL, Alliance.
To Washington, D. C., from Camp Dix, Lieut.-Col. J. A. SHERBONDY, Youngstown.
To Williamsbridge, N. Y., from Plattsburg Barracks, Lieut. G. H. REEVE, Cleveland.
The following order has been revoked: *To Hoboken, N. J.*, from Camp Dix, Lieut. J. C. STAATS, Cincinnati.

Oklahoma

To Indianapolis, Ind., from Vancouver Barracks, Lieut. W. M. SYKES, Ramona.

Oregon

The following order has been revoked: *To Fort Sheridan, Ill.*, from Fort Riley, Lieut. K. H. MARTZLOFF, Portland.

Pennsylvania

To Army Medical School, from Camp Meade, Capt. R. L. ENGLE, Philadelphia.
To Camp Wadsworth, S. C., base hospital, from Waynesville, Capt. A. TRASOFF, Philadelphia.
To Eastview, N. Y., from the Surgeon-General's Office, Major R. E. DAVISON, Pittsburgh.
To Fort McHenry, Md., from Camp Dix, Capt. G. M. LAWS, Lieut. A. P. BERG, Philadelphia; from Camp Joseph E. Johnston, Capt. R. E. STIFEL, Pittsburgh.
To Hoboken, N. J., from Camp McClellan, Capt. O. K. SPEER, Tamaqua; from Camp Sevier, Major W. K. EVANS, Chester.
To Muscles Shoals, Ala., from Camp McClellan, Lieut. A. F. KLUTZ, Philadelphia.
To Otisville, N. Y., from New Haven, Capt. S. A. LOEWENBERG, Lieut. B. A. McDERMOTT, Philadelphia.
To Panama Canal Zone, from Army Medical School, Capt. L. S. TOWNSEND, Beaver Falls.
To Pittsburgh, Pa., from Camp Dix, Capt. J. W. ROBINSON, Pittsburgh.
To Plattsburgh Barracks, N. Y., from Camp Dix, Major W. W. RICHARDSON, Mercer.
To Rockefeller Institute for instruction, from Lakewood, Capt. E. A. CAMPBELL, Chester. On completion *to his proper station*, from Fort McHenry, Lieut. H. L. SHAFFER, Pittsburgh.
To Saltville, Va., from Camp Dix, Lieut. W. H. MACKAY, Harrisburg.
To Walter Reed General Hospital, D. C., from Carlisle, Capt. C. C. MECHLING, Pittsburgh.
To Washington, D. C., Surgeon-General's Office, Lieut.-Col. D. SILVER, Pittsburgh; from Camp Dix, Capt. J. J. SINGER, Greensburg.
To Williamsbridge, N. Y., from Plattsburgh Barracks, Lieut. C. A. PATTEN, Philadelphia.
The following order has been revoked: *To Fort Sheridan, Ill.*, from Fort Oglethorpe, Lieut. H. E. MASSY, Sharon.

Porto Rico

To Fort Monroe, Va., from Camp Las Casas, Lieut. J. H. FONT, Barranquitas.
To New Haven, Conn., from Army Medical School, Lieut. C. S. MOSS, Jr., Ponce.

Rhode Island

To Fort Sheridan, Ill., from Camp Abraham Eustis, Major J. F. HAWKINS, Providence.

Tennessee

To Camp Gordon, Ga., as tuberculosis examiner, from Camp Beauregard, Capt. R. M. TUTLE, Martin.
To Camp Sherman, Ohio, to examine the command for cardiovascular diseases, from Camp Pike, Capt. O. N. BRYAN, Nashville.
To Camp Zachary Taylor, Ky., from Camp Sheridan, Lieut. C. T. WATERS, Memphis.
To Fort Des Moines, Iowa, from Camp McClellan, Lieut. S. BURCHART, Memphis.
To Fort Monroe, Va., as instructor, from Camp McClellan, Capt. J. M. LEE, Nashville.
To Hoboken, N. J., from Camp Hancock, Capt. R. W. DAKE, Nashville.
To Walter Reed General Hospital, D. C., from Camp Dix, Capt. J. D. L. McPHEETERS, Chattanooga; from Camp Lee, Lieut. J. W. SIMPSON, Nashville.

Texas

To Camp Travis, Texas, base hospital, from Camp Cody, Capt. J. W. McLAUGHLIN, Austin.
To Camp Wadsworth, S. C., base hospital, from Waynesville, Lieuts. W. C. COLBERT, Chicota; C. L. MOORE, Houston; J. W. REID, Jr., Mayfield.
To Dallas, Texas, Love Field, from Austin, Capt. L. C. G. BUCHANAN, Big Springs.
To Fort Riley, from Camp Cody, Lieut. E. B. BRANNIN, Dallas.
To Fort Sam Houston, Texas, base hospital, from West Point, Miss., Major W. R. JAMIESON, El Paso.
To Hoboken, N. J., from Yale Army Laboratory School, Lieut. J. M. HARRIS, Fort Davis.
To report to the Commanding General, Western Department, from Camp Lewis, Capt. J. J. JOHNSON, Sulphur Springs.

To Rockefeller Institute for instruction, and on completion *to his proper station*, from Colonia, Lieut. O. N. MAYO, Belton.

Virginia

To Camp Devens, Mass., as tuberculosis examiner, from Camp Wheeler, Major A. J. BLACK, Hollins.

To Camp Holabird, Md., from Camp Jackson, Capt. G. L. ZIMMERMAN, Pounding Mill.

To Camp Wadsworth, S. C., base hospital, from Waynesville, Lieuts. D. B. COLE, Chilhowie; J. L. STRINGFELLOW, Norfolk.

To Fort McHenry, Md., from Camp Dix, Major H. H. TROUT, Roanoke.

To Rockefeller Institute for instruction in the treatment of infected wounds, and on completion *to his proper station*, from Fort McHenry, Capt. J. M. ROBINSON, Danville.

The following order has been revoked: *To San Francisco, Calif.*, from Camp Jackson, Lieut. D. S. DIVERS, Roanoke.

Washington

To Fort Sheridan, Ill., from Camp Lee, Lieut. M. M. HANSON, Seattle.

To San Francisco, Calif., from Camp Jackson, Capt. H. H. HEWITT, Seattle; from Camp Lee, Capt. L. A. LAVANTURE, Ritzville.

To the retired list, from Vancouver Barracks, Col. R. G. EBERT.

West Virginia

To Camp Sherman, Ohio, base hospital, from Fort Sheridan, Major J. E. CANNADAY, Charleston.

Wisconsin

To Camp Lewis, Wash., as tuberculosis examiner, from Vancouver Barracks, Lieut. L. F. RUSCHAUPT, Milwaukee.

To Camp Sherman, Ohio, as tuberculosis examiner, from Fort Riley, Capt. J. W. LOCKHART, Oshkosh.

To Camp Travis, Texas, as tuberculosis examiner, from Camp Beauregard, Capt. A. EGDAHL, Menomonie.

To Fort Sheridan, Ill., from Camp Dix, Capt. F. E. ANDRE, Kenosha; from Camp Grant, Lieut. L. E. YOUMANS, Mukwonago.

To Walter Reed General Hospital, D. C., from the Surgeon-General's Office, Capt. B. H. HOLMES, Delavan.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST; SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

CALIFORNIA

Personal.—Dr. George B. Worthington has been appointed health officer of San Diego, succeeding Dr. Carl S. Owen, resigned.

ILLINOIS

Personal.—Leo M. Beilin, Captain, M. C., U. S. Army, Springfield, started for Siberia, February 15, and is to be placed in charge of a unit to combat typhus in the United States base in Siberia.——Dr. John A. Wheeler, Springfield, has been endorsed by the Sangamon County Medical Society as a candidate for commissioner of public health and safety.

Nurses' Bill.—A bill has been presented to the legislature for passage by the nurses of this state. After a conference between representatives of the nurses on one side, and the health department, Chicago Medical Society and Illinois Hospital Association on the other, it was not possible to reach an agreement. Another bill has been prepared for introduction by the Illinois Hospital Association.

Hospital Association Organized.—The Illinois Hospital Association has recently been organized, and the following officers have been elected: president, Dr. Malcolm L. Harris; vice president, Dr. William L. Noble; secretary, Dr. Egil T. Olsen, and treasurer, Dr. Carl O. Young, all of Chicago. The purpose of the association is "to promote the welfare of the sick, to make a study of hospital problems and work out solutions to the best interests of the sick and of the hospitals." The fair treatment of all hospitals in the standardization propaganda will also be taken up by the association.

Antituberculosis Work.—At the annual meeting of the Springfield Tuberculosis Association, February 11, Dr. Lewis C. Taylor was elected president, Dr. George Thomas Palmer, director, and Dr. Lewis C. Taylor and C. St. Clair Drake were elected members of the board of directors, and Dr. George F. Stericker, chairman of the executive committee. During the year the organization has not only retained the high standard of efficiency set for it, but has met the extraordinary war time demand and the further call for help during the influenza epidemic and in addition, has maintained competent and effective visiting nurse service.

Chicago

Personal.—Dr. Frederick A. Besley, formerly consulting surgeon, Second Army Corps, American Expeditionary Forces, who is visiting in San Diego, gave a talk on his experiences in France before the San Diego County Medical Society, February 11.

Opium Dens Raided.—In two raids, made February 18, seven Chinese believed to be agents of the opium trust were captured and $26,000 worth of opium and $20,000 in currency were seized. The raids were headed by W. H. Sage, chief of the narcotics department of the internal revenue division.

MARYLAND

Meetings.—At the regular meeting of the Baltimore City Medical Society, held in Osler Hall, February 21, Brig.-Gen. William S. Thayer, Baltimore, chief consultant of the medical division, and Major-Gen. John M. T. Finney, Baltimore, chief consultant of the surgical division, Medical Corps, United States Army, spoke on the work of their respective departments and were followed by Dr. Elizabeth Hurdon, late of the Royal Army Medical Corps.

Anniversary of Johns Hopkins.—Commemorating the forty-third anniversary of the opening of the Johns Hopkins University, exercises were observed publicly at 11 o'clock, February 22, in McCoy Hall. The principal address was delivered by Dr. George E. Vincent, president of the Rockefeller Foundation, who was introduced by Frank J. Goodnow, the president of the university. The trustees of the university, the faculty, the alumni council, the medical, philosophical and undergraduate students formed into a procession and marched to the hall.

MINNESOTA

Hospital Staff for Duluth Hospital.—A meeting was held in Duluth, recently, to further the organization of the medical staff for St. Mary's Hospital, and a committee consisting of Drs. Edward L. Tuohy, Alexander J. Braden, Clarence W. T. Taylor, Theodore L. Chapman, Emanuel Z. Shapiro was appointed to formulate a constitution.

Personal.—Dr. Edward E. Webber, Chisholm, has been appointed chief surgeon of the Duluth, Mesaba and Northern Railroad with headquarters at Proctor, succeeding Dr. William H. Magie, Duluth.——Dr. Blanche W. Horner, of the Rochester State Hospital, has been appointed assistant physician to the Kenilworth Sanatorium, Kenilworth, Ill., succeeding Dr. Ella Blackburn, resigned.——Dr. James H. Beaty has resigned as city physician of St. Cloud.——Dr. George McL. Waldie, New Bedford, has been elected secretary, and Dr. Wilbur N. Morell, Verndale, a director of the Wadena County Public Health Association.

New Officers.—At the annual meeting of the Upper Mississippi Medical Society, held in Brainerd, February 13, the following officers were elected: president, Dr. Arthur W. Ide, Brainerd; vice president, Dr. Audley V. Fankboner, Motley, and secretary-treasurer, Dr. John A. Evert, Brainerd. The next meeting of the association will be held at Pine River, May 20.——At the annual meeting of the Southern Minnesota Medical Association, held in Mankato, January 21, the following officers were elected: Dr. John Williams, Lake Crystal, president; Drs. Walter E. Sistrunk, Rochester, and Walter J. Richardson, Fairmont, vice presidents; Dr. Henry T. McGuigan, Red Wing, secretary (reelected), and Dr. George F. Merritt, St. Peter, treasurer (reelected).

MONTANA

Personal.—Dr. Olive B. Cordua, Helena, has been appointed state chairman of the movement which the American Women's Hospitals have started to raise $250,000 for relief work in Servia, and she has named as district chairmen, Drs. T. A. Bottors, Belt; Agnes J. H. Doty, Billings; Hazel Freed, Grass Range; Olive M. S. Meany, Plains; Lillian G. Miller, Hamilton; Caroline McGill, Butte; Anna A. C. Owens, Hamilton; Helen C. Roberts, Great Falls, and Alma M. B. Ruble, Columbus.——Dr. Patrick H. McCarthy, Butte, has been reappointed secretary of the Silverbow County Board of Health.——Dr. Arter W. Deal, Lewistown, health officer of Fergus County is reported to be seriously ill in St. Joseph's Hospital, Lewistown.——Dr. Harmon T. Rhoads, Choteau, has been appointed county physician of Teton County.——Dr. Benoni A. Place, Great Falls, has been reappointed physician of Cascade County.——Dr. Joseph A. Piedalue has resigned as health officer of Bozeman.

NEBRASKA

Personal.—Dr. Edgar A. Pickens, Benkelman, has been appointed staff physician at the Lincoln State Hospital, succeeding Dr. Richard H. Spradling, Lincoln, who has been made assistant superintendent. Dr. Spradling in his turn succeeeds Dr. N. H. Newell, Lincoln, resigned to take up postgraduate medical work in the East.

New Home for Medical Society.—A fourteen or sixteen story building is to be erected at Omaha this year to be occupied exclusively by members of the medical and allied professions. It will be leased and operated by the Douglas County Medical Society, with the exception of the two lower floors which will be retained for general rental purposes.

NEW YORK

Influenza Sweeps Transport.—The transport *Manchuria* which arrived in this port, February 22, carrying over 4,000 returning troops was swept by an epidemic of influenza during the trip. There were 168 men who contracted the disease, twenty-four of whom developed pneumonia. Four of these died.

Tuberculosis Clinic in Canton.—The first of a series of tuberculosis clinics in St. Lawrence County was held in the Town Hall, Canton, February 14, when twenty-three patients presented themselves for examination. The results of the diagnoses made by Dr. Stanley Wang of New York City were: positive tuberculosis cases, 12; suspicious cases to be kept under observation and reexamined, 5, and negative for tuberculosis, 6.

Syracuse Health Officers' Course.—The next residence course for health officers, under the auspices of Syracuse University, will commence, March 28. This course is not limited to health officers but is open to all physicians who wish to acquaint themselves with the latest developments in public health work. Further information regarding this course and registration blanks may be obtained from Dr. Frederick W. Sears, 602 West Onondaga Street, Syracuse.

Water Supply Improvements at Watertown.—A novel improvement has been carried out at Watertown in connection with the gravity mechanical water filter for the city. For the purpose of reducing the high turbidity of the Black River water a large sedimentation or coagulation basin has been formed out of one of the channels in the river lying between an island and the mainland, by placing dams across the channel at the upper and lower ends of the island, thus providing large sedimentation capacity at very low cost. Alum is applied to the water by a whirlpool device at the inlet end.

New York City

Physicians Association Meeting.—At the meeting of the New York Physicians Association, held, February 27, the paper of the evening was read by Dr. Joseph Fraenkel, on "Internal Secretions."

Influenza in Sing Sing Prison.—A new outbreak of influenza is reported from Sing Sing prison. There were twenty-five prisoners ill with the disease, February 15. Dr. Amos O. Squire, Ossining, the prison physician, reports that during the first epidemic there were ninety patients under treatment and that not one succumbed, though a number contracted pneumonia.

Personal.—Capt. Gouverneur M. Phelps, M. C., U. S. Army, who has worked on all the battle fronts except the Italian, recently returned to his home in this city.——Dr. Stephen Smith celebrated his ninety-sixth birthday, February 19. He is still in good health and only resigned from his position on the State Board of Charities in February, 1918, after having served on the board for thirty-four years.

Class in Roentgenography for Women.—Hunter College for Women offers to give a systematic course of training in the technic of roentgenography. The course lasts from two to three months, and consists of dark room technic, regulation of roentgen ray tubes, principles of machinery, placing of the patient for the various roentgenograms, making the exposures, etc. In connection with this training a thorough course in anatomy and physics is given. Hunter College is the first institution of its kind to offer such a course to women.

War Community Service for Physicians.—Members of the medical profession of this city have been advised that a Convalescent Bureau has been established by the Officers Service Department of the War Camp Community Service at Madison Avenue and Forty-Fourth Street. The object is to offer to any officer of the United States Army, Navy, or Marine Corps, on furlough or after discharge from the service, every opportunity for rest and recuperation in the country. Hospitality is offered in private homes at very reasonable rates and special rates have been secured in out-of-town hotels and country clubs.

Child Welfare Conference.—The New York State Association of Child Welfare Boards recently held a three day session in this city. In welcoming the delegates the acting mayor promised consideration by the city officials of any program agreed on and paid a tribute to the work the child welfare boards were doing. Health Commissioner Copeland advocated government control of milk and deplored the fact that such a large proportion of the hospital beds in New York hospitals were in private institutions. One of the aims of the welfare boards is to secure further legislation to provide for the maintenance of widows and their children, so that widowed mothers would be enabled to give their children better protection. Assemblyman Martin McCue stated that he would do everything in his power as a member of the legislature to advance legislation to make the work of the boards more effective.

NORTH DAKOTA

Trachoma Hospital Established.—The seventh trachoma hospital established by the United States government has been opened in La Moure, under the charge of Dr. Clarence E. Downes.

Personal.—Dr. George A. Carpenter, Fargo, has been appointed superintendent of the Cass County Board of Health. ——Drs. H. Haugen, Tindred; William F. Baillie, Hunter; Howard B. Huntley, Leonard; Horace Clark, Wheatland; Sidney B. Clark, Buffalo; Harry J. Gowenlock, Gardner, and John B. James, Page, have been appointed county physicians of Cass County.

New Officers Elected.—At the annual meeting of the Sheyenne Valley District Medical Society held in Valley City, January 29, Dr. Ross D. Benson, Hannaford, was elected president; Dr. Clinton E. Spicer, vice president, and Dr. Samuel A. Zimmermann, secretary-treasurer.——Devils Lake District Medical Society held its annual meeting in Devils Lake, January 21, and elected Dr. John G. Lamont, Dunseith, president; Dr. Arthur T. Horsman, Devils Lake, vice president, and Dr. George F. Drew, Devils Lake, secretary-treasurer.——At the annual meeting of the Grand Forks District Medical Society held in Grand Forks, January 8, Dr. Gudmund J. Gislason was elected president; Dr. H. J. Montat, vice president; Dr. Henry J. Frieskn, secretary, and Dr. Henry W. F. Law, treasurer.

OHIO

Personal.—Dr. Stephen A. Douglass, superintendent of the Mount Vernon State Sanatorium, who has been in Italy with the American Tuberculosis Commission, has returned and resumed his duties.

Health Certificates for Restaurant Employees.—The Lonz bill now pending in the legislature requires persons employed in restaurants or other places where food is prepared for sale to submit to a semiannual medical examination under the direction of local health authorities, and to present certificates of freedom from contagious or infectious diseases.

Coroner's Elect Officers.—At the annual meeting of the State Association of Coroners, Dr. Theodore C. McQuate, Canton, was elected president; Dr. William C. Heintz, Columbus, vice president, and Dr. Arthur C. Bauer, Cincinnati, secretary-treasurer. A special legislative committee was appointed to draft a bill placing coroners on a salary basis instead of on a fee system.

Committee on Mental Hygiene.—A state organization for mental hygiene is to be formed which will cooperate with the national committee. Preliminary steps have been taken by the appointment of Drs. Erl Baber, Dayton; Emerson A. North, Cincinnati, and Ora O. Fordyce, Athens, as a committee to present a plan for the organization of the Ohio branch of the national association.

OKLAHOMA

Personal.—Dr. G. Fowler Border, Mangum, has been elected secretary of the Greer County Medical Society, succeeding Dr. Thomas J. Horsley, deceased.

Society Reorganized.—The physicians of Comanche County met at Lawton, January 15, and reorganized the Comanche

County Medical Society, electing Dr. Alexander H. Stewart, president; Dr. Francis E. Rosenberger, vice president, and Dr. E. Brent Mitchell, secretary-treasurer.

Sanatoriums for Tuberculosis.—A bill has been presented in the legislature for the equipment and maintainance of six sanatoriums in the state. For this purpose an initial appropriation of $600,000 has been asked for building, and also an annual appropriation of $75,000 for maintenance.

OREGON

Influenza.—No deaths were recorded from this disease in Portland, February 12, and but eleven new cases were reported. All bans were lifted, and for the sporadic cases occurring a rigid two weeks' isolation was to be enforced.

PENNSYLVANIA

Personal.—Capt. Edwin B. Marshall, Annville, who spent over a year in France, has returned home.——Dr. Thomas L. Doyle of Tremont has been decorated with the military cross by King George for gallantry. Dr. Doyle was formerly chief resident physician at the Hahnemann Hospital, Philadelphia.

Hospital Items.—General Hospital No. 17 at Markelton, Pa., has been designated by the surgeon-general for soldiers having pulmonary tuberculosis.——The new hospital built by the Emergency Fleet Corporation, will be converted into a general hospital for the people of Bristol and surrounding districts.——The contract for construction work amounting to $343,000 has been awarded for the erection of four one-story buildings and two two-story buildings at Hamburg, Pa. Large additions are also contemplated for the General Hospital and for the St. Joseph Hospital of Lancaster, Pa.

Philadelphia

Army Hospital Opened.—A new U. S. General Hospital was opened, February 17, and occupies part of the Philadelphia General Hospital and has accommodations for 5,000 service men. The hospital force numbers twenty-seven officers, 225 enlisted men and fifty nurses.

Officers Elected.—The annual reunion and business meeting of the Alumni Medical Society of the University of Pennsylvania was held at the Bourse, February 15, and the following officers were elected: president, Dr. B. Franklin Stahl; vice presidents, Drs. Radcliffe Cheston, Henry D. Jump, Lewis H. Taylor, Wilkes-Barre; Park Weed Willis, Seattle; William L. Harris, Providence, R. I.; Alexander R. Craig, Chicago; historian, Dr. William Pepper, and secretary and treasurer, Dr. Floyd E. Keene.——The following officers for the Philadelphia branch of the society were elected: president, Dr. Henry D. Jump; honorary vice president, Dr. E. F. Smith; first vice president, Dr. Clarence P. Franklin; second vice president, Dr. Paul G. Sartain; third vice president, Dr. John J. Robrecht; corresponding secretary, Dr. Stephen E. Tracy; recording secretary, Dr. William O. Hermance, and treasurer, Dr. Herbert B. Carpenter.

Personal.—Dr. Caroline M. Purnell, of the staff of the Women's Hospital of Philadelphia, has returned from France after spending four months as special commissioner for American women's hospitals.——Dr. James A. Babbitt, who has been in France since May, 1917, with the Friends' reconstruction unit, has been chosen a member of the Red Cross commission to go to Germany to help the 1,200,000 Russian prisoners there to get home.——Dr. Ross Hall Skillern, who for the past six months has been commanding officer of Base Hospital No. 89 in the south of France, has returned home.——De La Ray Signor, Captain M. C., U. S. Army, who was with the 309th field artillery, having been gassed and having contracted influenza, which compelled him to give up his duties at the front, has been placed in charge of Camp Hospital No. 72 at Chateau-du-Soir.——Lieut. David R. Morgan, who received the Croix de Guerre and four citations for his work as a medical officer with a French detachment, has returned home.

VIRGINIA

Personal.—The following members of the faculty of the Medical College of Virginia who have been in the United States service have returned to their former positions: Dr. Blanton L. Hillsman, Richmond, associate in surgery; Aubrey H. Straus, assistant professor of bacteriology, and Phillip F. Fackenthall, professor of pharmacognosy and botany.——Dr. Edward L. Flanagan, Richmond, has been separated from the Army Medical Corps and has been made full-time health officer of Fairfax County.——Dr. J. Fulmer Bright, Richmond, has been commissioned major, M. C., Virginia Militia.——Dr. V. L. Staton has succeeded Dr. John C. Sleet as epidemiologist of Norfolk.

Election.—At the annual meeting of the Warwick County Medical Society held in Newport News, January 22, Dr. William F. Cooper was elected president, Dr. Aaron Jeffery, vice president, and Dr. Dexter W. Draper, secretary-treasurer. At this meeting final arrangements were made for the unveiling of the Walter Reed Memorial Tablet at the Walter Reed High School.

WASHINGTON

Personal.—Dr. Ivan P. Balabanoff, Tacoma, has presented to the health department of the city of Tacoma a completely equipped ambulance to be used in connection with the Contagious Disease Hospital, in memory of his wife, Dr. Margaret L. Carsley Balabanoff.——Dr. Henry H. McCarthy, Spokane, has been elected president of the state board of health.——Dr. John B. Anderson, health officer of Spokane, was elected state health commissioner, Februray 10, to succeed Dr. Thomas D. Tuttle, Seattle, who is reported to have accepted an offer from the United States Public Health Service.

WISCONSIN

Decision Against "Plaster" Doctor Affirmed.—The Supreme Court, February 5, affirmed the decision of the circuit court, declaring that John Till, the notorious "plaster" doctor of Turtle Lake, was practicing medicine without a license and sustained the sentence of a fine of $250. This man conducted a place near Turtle Lake at which treatments were given for all sorts of ailments, and was accustomed to request each person who came to see him, to sign a card and to pay 25 cents before seeing him. The card was a waiver of all claims for damages arising out of any treatment that he might give or might omit to give. The district attorney of Baron County prosecuted Till, charging that he practiced medicine without a license, and he was found guilty and fined $250, but promptly appealed his case.

GENERAL

Roaldes Prize.—The Roaldes prize of the American Laryngological Association, amounting to $200, is offered this year in general competition for the best thesis on some subject directly connected with laryngology or rhinology. Papers must be in the hands of the secretary, Dr. D. Bryson Delavan, 40 E. Forty-First Street, New York City, prior to June 1.

New Red Cross Head.—Dr. Livingston Farrand, Boulder, president of the University of Colorado, has been appointed by President Wilson to be chairman of the central committee of the American Red Cross, to succeed ex-President William H. Taft. Dr. Farrand will become executive head of the national Red Cross organization on the retirement of the war council, March 1. On this date the Red Cross will be changed from a war to a peace basis.

Fraternity Dinner.—The Alpha Omega Alpha Honorary Medical Fraternity announces that the three Chicago chapters of the society located, respectively, at the University of Illinois, University of Chicago and Northwestern University, will give a dinner on the first day of the annual Congress on Medical Education and Licensure, March 3, at the Hotel LaSalle, at 6:30 o'clock. Dr. William A. Evans, Chicago, will officiate as toastmaster, and among the speakers will be Dean John L. Heffron of Syracuse University, president of the organization, and Dr. William W. Root, Slaterville Springs, N. Y., secretary-treasurer.

Missionary Health Board.—The joint centenary of the Methodist Episcopal Church announces the establishment of a medical department under the direction of the board of foreign missions to guard health efficiency of its missionary workers. Dr. John G. Vaughan, formerly of Nanchang, China, is executive secretary of the new department with temporary offices at the headquarters of the Missionary Centenary, 111 Fifth Avenue, New York City. Dr. Vaughan has been until recently, a member of the surgical staff of the Rock Island System in Chicago, leaving that position to organize the new medical department of the Methodist Foreign Missionary Board.

Bequests and Donations.—The following bequests and donations have recently been announced:

Philadelphia Home for Incurables, Children's Hospital, Philadelphia Training School for Feeble-Minded Children, and two other charitable

institutes, the entire estate valued at $24,000 by the late Justus Branner, after the death of the beneficiary.

Hahnemann Medical College, Philadelphia, a fund of $200,000 for research work in connection with the fight against influenza, by Walter E. Hering, Philadelphia.

Hatfield Memorial Park and Convalescent Hospital, Wagontown, Chester County, with maintenance by an annual trust fund of $10,000, is provided in the will of Mrs. M. F. Hatfield.

Howard Hospital, Philadelphia, $2,000, by the will of Gustavus B. Benson, Jr.

Missionary Hospitals in South America.—Miss Charlotte A. Aikens of New York, editor of the *Trained Nurse and Hospital Review*, has been engaged to make a tour of the Argentine Republic, Uruguay, Chile, Bolivia and Peru, to study the conditions which prevail there and the needs of the field for hospitals. After her report has been received, the number and location of the hospitals and health stations to be established in the five republics as part of the centenary program of the Methodist Episcopal Church will be announced. By interdenominational agreement, these hospitals are placed under the supervision of the Methodist Episcopal Church, which is raising $120,000,000 for world upbuilding and the extension of missionary work.

FOREIGN

Scandinavian Congress for Internal Medicine.—The internists of the Northland, organized in the Nordisk Forening for indv. Medicin, announce that a congress will be held at Copenhagen late in August, 1919. The last meeting of the kind was at Lund in 1913.

Tribute to the Medical Officers of the Italian Army and Navy.—In tribute to the medical officers of the Italian army and navy an imposing ceremony was recently organized at Naples by the *Riforma Medica* to do honor to the medical officer who had been awarded the largest number of decorations for exceptional gallantry and devotion. This was Capt. Raffaele Paolucci, the "hero of Pola." The *Riforma Medica* of January 4, reproduces the addresses and the portrait of the young naval medical officer and the trophy presented him at the meeting. It represents a silver winged victory, alighting on a marble pedestal, with bas reliefs and inscriptions. The ceremony was a tribute to the gallantry and devotion displayed by the whole of the medical profession on land and sea during the war. It was especially appropriate to have it at Naples as Dr. Paolucci is a graduate of the medical school there. He has a record of good work also in the African campaigns before the great war began.

A Fellowship in Medicine.—At a meeting early in the year at the house of the Royal Society of Medicine in London, presided over by Sir Arbuthnot Lane, a movement was started for the formation of an association for cooperation in medicine among the English speaking physicians of the world. The promotion of a mutual understanding between the medical profession of the United States and the British Empire was the main objective of the movement, which has progressed so far that the Royal Society of Medicine has now issued a cordial invitation to the medical men of the dominions and of America, as well as to the medical men of the allies, to use the buildings of the society in London as the home of a fellowship of medicine with the tentative name, "The Interallied Fellowship of Medicine." The movement has the support of the Director General of the Army Medical Service, the Surgeon-General and others. An account of the meeting at which the organization was launched is contained in *The Lancet*, Jan. 4, 1919.

SOUTH AND CENTRAL AMERICA, MEXICO AND WEST INDIES

Silver Jubilee of the "Semana Medica."—We have been listing the contents and reviewing our Buenos Aires exchange for almost a generation, and the 800 pages of the volume just closed with 1918 finishes its twenty-fifth year of existence.

On the occasion of this silver jubilee a festival gathering was held at the headquarters of the journal with much ceremony and congratulations. The *Semana Medica* was founded by Dr. T. Padilla hijo. The present director is Dr. D. Decoud, professor of surgery at the University of Buenos Aires, and the editorial staff consists of twenty-six professors in the university besides Dr. E. R. Coni, the leading hygienist of Argentina, and Drs. V. Delfino and A. Chueco, the latter chief of the surgical service in the Fernández Hospital. The list of professors includes many names of international reputation, from Penna, Agote and Ingenieros to Boero.

MADRID LETTER

MADRID, Jan. 15, 1919.

Influenza in Spain

Since my last letter, influenza has been ravaging the land, leaving a trail of sorrow and tears. It was at the close of the summer that the country, disturbed and suffering from food privations, agitated by political campaigns and sectarian maneuvers, awoke one morning to the realization that a disease was rapidly sweeping away its people by hundreds. The civilian authorities in certain places were apparently responsible for the blunder of concealing the evil at its beginnings, at a time when it might have been possible to apply the remedy of isolation. San Sebastian, for instance, is a delightful city on the northern coast, close to France, with a populace trained in hygiene, and a model municipal administration. It is the residence of the court during August, September and October, and was full of "resorters" from all over Spain. This city became one of the chief foci of the epidemic, and from there, by the dispersion of its alarmed visitors, the disease spread to other provinces.

CRITICISM OF OFFICIAL MEASURES

The daily papers took advantage of the occasion to play politics, censuring what the government was doing and contributing to the general alarm and worry. All classes of society were victims of influenza, even the king, who had the disease in quite a serious form for a time.

CRITICISM OF CHIEF OF PUBLIC HEALTH SERVICE

The chief of the Public Health Service of Spain, which is subordinate to the ministro de la gobernacion (interior), is the director general or inspector general de sanidad. This position is now held by Dr. Don Manuel Martin Salazar, trained in hygiene in other countries, author of a fine treatise on immunity. He reached his position by the reputation gained from his works and the fact that he had become an authority on epidemics by his successful campaign against several, among others the epidemic of plague on the Canary Islands, at the time when Dr. Pulido was director general de sanidad. Articles were published aiming to create dissatisfaction and distrust. Politics intervened, and charges were preferred, but the government came out victorious as the proceedings brought out in a good light the work done by Dr. Salazar. He has remained in his position. As the tide of politics has swept away for the present the possibility of the appointment of a minister of health as a member of the cabinet, the campaign against Dr. Salazar has been dropped. However, all activity has some use, and the activity displayed by those who have been stirring up public opinion to such an extent has emphasized the necessity for more ample appropriations for the Public Health Service, and has contributed to facilitate the approval by parliament of the expenses incurred in combating the epidemic of influenza.

Interview with Chief of Public Health Service in Spain

In the present circumstances, the most interesting person from a medical point of view is the above mentioned Dr. Martin Salazar. In order to inform the readers of THE JOURNAL in regard to his impressions of the epidemic of influenza here, I asked for an interview with him. Dr. Salazar hastened to grant my request for an interview, expressing at the same time his high appreciation for THE JOURNAL, of which he is an assiduous reader.

THE TWO PHASES OF THE EPIDEMIC

He emphasized the two epochs of this epidemic, each with its different characteristics. The first phase, that of last spring, was an epidemic of the cities, spreading rapidly and widely but without a high death rate. It conferred positively an immunity. This immunization has benefited the populace of the cities where the disease at first spread so rapidly and widely, as at Madrid, Badajoz and Sevilla. On the other hand, the towns which were spared at the first invasion, such as Barcelona, have suffered most at the second invasion.

THE SECOND INVASION

This second invasion, according to Dr. Salazar, had two beginnings. It commenced, on one hand, in those provinces which have the closest relations with foreign countries and, on the other hand, it broke out in autogenous foci at different points, such as those among the troops. The new recruits in the barracks scattered over the country, formed the main contingents in the first appearance of the epidemic

at the close of the summer. This is a phenomenon difficult to be explained unless by the immunity of the older soldiers who had had the influenza in a milder form in the spring, while the new recruits were attacked with the gravest forms of the disease. The barracks at Carabanchel near Madrid, and at La Granja in Segovia had at certain times as many as 3,000 and 4,000 down with the epidemic, and the death rate was high, although it varied widely in different regions. The pulmonary forms were common as also the hemorrhagic forms, and the deaths were sudden.

In the general population, Castellon on the Mediterranean coast was one of the worst foci of the epidemic, while the provinces bordering on France were becoming invaded. The extremely rapid and extensive spread of the epidemic coincided with the return to Spain of the thousands of laborers who had been engaged in the vintage in southern France. The disease spread like dust before the wind, and all parts of Spain, except the south, were affected. The southern provinces are now in the throes of the epidemic. At the same time Portugal was invaded by the influenza, probably brought by soldiers returning from the front in France.

In this way, as in all great pandemics, there were autogenous foci and exotic foci, and there was communication between them in spite of all the strict supervision of the frontiers which was excessive. The inspector general remarked that if he had anything to regret, it was that he had done too much; that, impelled by public opinion, he had gone beyond the limits of the scientific.

CONTAGIOUSNESS OF INFLUENZA

The inspector general de sanidad declared that the disease is so contagious that there is no means of avoiding it. The only differences in the behavior of the disease in different countries are those resulting from poverty and home conditions. Gathering in the harvest was the principal cause of the diffusion of the disease.

PROPHYLAXIS

In these infections, he added, public prophylaxis places all its hope in preventive vaccines. The British vaccine prepared for the army and navy is made with Pfeiffer's bacillus, the pneumococcus and hemolytic streptococci. From the beginning of the epidemic Dr. Salazar planned the preparation of a specific vaccine and despatched an expert bacteriologist, Dr. Falco, and appointed Dr. Ferran as delegate to study the preparation of vaccines and their application to the sick. At the same time he encouraged the municipal laboratory of Madrid to prepare a vaccine, and all the public health officials there were vaccinated with it. In Valencia, Dr. Ferran and Prof. Peset applied the vaccine, on a large scale, but their tests are not conclusive as the epidemic was already declining at the time. Hence the experiences with vaccine are not adequate to pass any judgment as to the value of preventive vaccination.

IMPORTANCE OF THE EPIDEMIC

It is evident that influenza is one of the gravest scourges that can afflict a country, not only on account of the enormous numbers of persons affected but by the mortality which, although not high in comparison to the numbers attacked, yet is very large considered as a whole. The death rate for those affected was about 3 per thousand but in some places it reached 6 per thousand. The germs encountered were the Pfeiffer bacillus, the pneumococcus and streptococcus.

THE COST OF THE EPIDEMIC

The Public Health Service was put to great expense by the epidemic. It has already paid out 750,000 pesetas and there is much yet to pay. The scarcity of physicians in certain regions and proportionately in others caused many of these places to importune the service for medical aid and an appeal was made for volunteers to go to these points. These volunteers were paid by the government at the rate of 50 pesetas a day, about $10, unless they were being paid already by the municipal authorities. Many physicians succumbed to the epidemic. The total number of deaths from it in the profession is not known yet, but it is over a hundred. The number of the dead and of the disabled will soon be known with precision as the families of the deceased (widows and orphans) have a right to a pension.

FRONTIER SANITARY SERVICE

Dr. Salazar complained that the political powers had never listened to his constant appeals for the reorganization of the sanitary service, but he insisted that, in spite of this, the frontier *servicio sanitario* in Spain is at this very moment of a higher grade than that existing elsewhere, even in France. There are in Spain seven first class *estaciones sanitarias*, two on the French border, at the eastern and western ends, and five on the border of Portugal, with a large number of stations of the second class. Each of the seven first class stations has complete laboratories, animals for experimental research, sterilization plants, etc., and an abundant and select personnel kept abreast with progress by the studies and practical work required of them. Each of the seven stations has its special hospital.

The Outlook for the Public Health Service

The inspector general de sanidad had been urged by friends to take a much needed rest, when recently a man of courage and capacity was appointed ministro de la gobernacion (possibly acting premier) the man who is the hope of the physicians of Spain, Dr. Gimeno, the first physician to be appointed to that cabinet position. The inspector general meets in the new minister a capacity which understands, and he feels the breath of new life; he has recovered his health and energies and turned again with zeal and a smile to renew the battle against disease and ignorance.

MEXICO LETTER

Mexico City, Feb. 9, 1919.

Death Rate Exceeds Birth Rate in the Capital

According to some recently published statistics, there were 21,915 deaths recorded in the city of Mexico during 1918, and only 7,542 births, which seems to indicate that the population has been reduced by 14,373. But this last figure cannot be regarded as accurate because there are always a number of persons who fail to comply with the official regulations for notification in the respective bureaus of the birth of their children. But even making allowance for all this, there is no doubt that the death rate exceeded the birth rate. Influenza was responsible for 1,935 deaths, syphilis for 232, bronchitis for 1,556, bronchopneumonia for 1,456, pneumonia for 2,312, enteritis for 5,496, and various ailments for the other deaths. The high figure of the deaths from pneumonia is remarkable but this is not restricted, I believe, to Mexico.

Is Asiatic Cholera in New York?

Some alarm has been aroused by news received from Vera Cruz to the effect that the papers of a ship arriving from New York specify the existence of Asiatic cholera in that important city of North America. The sanitary authorities have been investigating since then the truth of this rumor.

Bovine Tuberculosis

The Departamento de Salubridad has arranged for a rigorous inspection of cattle imported into Yucatan, as it has been learned that a large number of cows which have been brought into the country by the port of Progreso have been found affected with tuberculosis. A commission of veterinarians has been appointed to take charge of the matter. There had previously been no official inspection of cattle at this port of Progreso, and unscrupulous sellers and purchasers of live stock took advantage of this fact to unload there their sick cattle, with grave injury to the public health.

Typhus

During the last week of January, there were forty-nine cases of tabardillo recorded, and the week following, fifty-eight cases of the same. Tabardillo is endemic here, and it flares up again and again with most distressing periodicity, notwithstanding the measures taken to keep it under control.

Radium

The government of the federal district has acquired an amount of radium valued at $10,000, and it has arranged that the precious metal can be utilized by physicians who wish to apply it in the treatment of cancer, provided that they are adepts in its use. When the patients are poor, the radium will be supplied gratuitously, but those able to pay will be charged a modest rent for the loan of the metal.

Smallpox

This serious disease has appeared in epidemic form in the state of Sinaloa, adjoining Sonora. Numerous cases have been reported.

Inauguration of the University Courses

The courses for the new year were inaugurated the 7th, the rector of the university, Lic. J. N. Macias, presiding.

The formal ceremony was held in the amphitheater of the Escuela Preparatoria. The culminating note of this gathering was the friendly tone employed by two of the speakers in referring to the United States, one of them Dr. Castanedo of the Facultad de Medicina, in speaking of the present situation of the world. The importance of this fact will be understood better when it is realized that until quite recently it was an evidence of patriotism (?) to attack our neighbors to the north, and that sooner or later the influence of the universities will be felt in the formation of the national spirit and in the march of public affairs.

PARIS LETTER

PARIS, Jan. 30, 1919.

Management of War Wounds of the Deep Urethra

This question was the subject of an important discussion at the fourth reunion of the chefs de centres génito-urinaires which was held recently. Dr. Heitz-Boyer, chief of the surgical clinic of the Paris medical faculty, maintained that at the front the treatment of lesions of the posterior urethra is determined by the fact whether this is the only wound or whether it is associated with wounds of other viscera and of the bones. When only the urethra is involved, the soft parts must be treated with as much care as the urethra itself. The treatment of the soft parts consists in the excision of contused tissues; immediate suture not being indicated in the majority of cases, especially when the wound is in the gluteal region; secondary suture or delayed primary suture is better here. The treatment of the urethra varies according to the case. If the lesion is not extensive and of recent origin, immediate suture is indicated, with a retention catheter. If the lesions are very extensive and more than forty-eight hours old, the urethral wound should be left open and the urine evacuated, preferably through a suprapubic opening into the bladder; this is particularly indicated in prostatic lesions.

TREATMENT OF ASSOCIATED LESIONS

The treatment of the associated lesions consists in immediate suture of the anus, with the production of temporary constipation. In cases of wounds of the lower segment of the rectum it is only rarely possible to resort to immediate suture; it is best to perform a colostomy at the outset through which the bowel contents can be evacuated. If diversion of the urine is also necessary, this should be done through the perineum. In cases of pelvic cellulitis, excellent drainage may be obtained by resecting the coccyx. If there is present a bladder wound, suprapubic cystostomy is always indicated. Associated bone lesions demand cleaning out the wound very thoroughly, removing all bone fragments, and assuring maximum drainage by interrupted irrigation, preferably with ether. The existence of extensive lesions of the venous channels, especially those of the pelvis, demands evacuation of the hematoma, ligation of the bleeding vessels, if necessary, and free drainage.

OBSTRUCTION OF POSTERIOR URETHRA

Dr. Marion of Paris presented a report in which he drew the following conclusions: In the presence of an obstruction in the posterior urethra, the result of trauma, the two ends of the urethra are caught up, any interposing tissue is dissected out, and the urethral canal is reconstructed by end-to-end suture anastomosis, if possible; if not, by bringing the periurethral tissues into approximation, if urethrorrhaphy is impossible. When a urethrorrhaphy is done, no catheter should be placed in the urethra. If the ends of the divided urethra are separated widely or retracted or contracted, a dilatation should be done, and if this fails, internal urethrotomy should be attempted. If this procedure also fails, then urethroplasty must be done, as in any case of obstruction. Whenever the urethral lesion is complicated by fistula, it is well to make sure at the very outset that the surrounding tissues or areas have been put in the best sanitary condition (cystostomy, opening of abscesses, removing foreign bodies, calculi and sequestra) and then introduce a urethral catheter. This is often sufficient to produce a cure.

URETHRORECTAL FISTULA

In cases of urethrorectal fistula, the urethra is separated from the rectum and then the openings in each canal may be closed in any one of the following ways: (1) Each opening is closed separately and periurethral tissues are interposed between the rectum and urethra; (2) a flap of rectal mucosa is drawn down over the fistulous opening; (3) the rectum is divided above the sphincter, and the upper end is sutured into the anal margin, if there is narrowing of the rectum. Exceptionally, colostomy will have to be done to provide for proper emptying of the bowel. In cases of extensive destruction of the urethra and of the perineal tissues, autoplasty must be resorted to, making use of the scrotal tissues and of the skin of the thigh. When the posterior urethra is completely destroyed, with, perhaps, destruction of the anus, recourse must be had to a cystostomy, and sometimes to perineal urethrostomy with iliac colostomy if the anorectal lesions are irreparable.

FUNCTIONAL DISTURBANCES

Finally, when all these lesions have been repaired, if the patient still has functional disturbances, a periurethral abscess must be thought of, or a persisting foreign body, and the proper treatment instituted. The urethra having been repaired, it is important that the patient be taught the use of a dilator, or that he remain under supervision for a certain time, so as to prevent a narrowing or a deviation of the urethral canal. In order to secure a good view of the posterior urethra, it is desirable to have most ample access. Among the best procedures for exposing this region well, in an appropriate case, is the freeing of the median puboprostatic fascia.

DISCUSSION

Dr. Escat of Marseilles has seen 24 cases of trauma of the pelvic urethra, with accompanying bone lesions in 17 cases, anal or anorectal lesions in 12 cases, lesions of the bladder in 8 cases. By the time these cases reach the base hospitals, chronic infection is present, loss of tissue entailing fistulas and strictures. The trauma usually involves either the prostatic or the membranous urethra.

Dr. Michon of Paris advised that in the less severe or mild cases the treatment at the front should aim to approximate the torn ends of the urethra so as to make easier the surgical intervention which remains to be made at the rear. Suprapubic cystostomy should always be done in these cases because it is an easy means for draining the bladder, and favors constant supervision of the case. He has never found it necessary to perform a colostomy (iliac), and in order to prevent the development of pelvic cellulitis, he prefers to drain the pelvis through the perineum. The prolonged retention of the urethral catheter is not favorable to urethral suture. If it is feared that the subsequent introduction of dilators will be difficult, a conducting thread may be left in the urethra and drawn out through the suprapubic opening. The catheter may be attached to this guide.

Dr. Pasteau of Paris expressed the opinion that at the front in cases of wounds of the deep urethra, the wound should be opened widely, as much as the state of the patient will permit, the region thoroughly explored and provision made for ample and free drainage; the bladder itself should be drained through a suprapubic opening, and likewise any juxta-urethral focus which may have resulted from the trauma or the operation. On the other hand, at the rear, if the posterior urethra has been seriously injured, make a suprapubic cystostomy and drain the perineal region freely; avoid suture of the perineal fascial planes; search for the torn ends of the urethra, place them in apposition, using a retention catheter if necessary. Finally, open widely all the perineal foci and fistulas that may be present, and keep them open, for which purpose the suprapubic cystostomy is helpful. This is the best treatment, preventive and curative, of strictures from lesions of the deep urethra, in which the prognosis is always grave.

Marriages

LINCOLN HUMPHREYS, Asst. Surg., Lieut. (j. g.), U. S. Navy, North Little Rock, Ark., to Miss Julia Josephine Youngquist of St. Paul, at Washington, D. C., January 14.

BRET ALBERT SWARTZ, Lieut., M. C., U. S. Army, Los Angeles, on duty at Camp Kearny, San Diego, Calif., to Miss Daisy Stegg, also of Los Angeles, January 29.

EDMUND LEO FINLEY, Rochester, N. Y., to Miss Irene Elizabeth Dunn of Rome, N. Y., February 18.

GEORGE MILLARD DAWSON to Miss Margarethe Dittrich, both of New York City, February 12.

Deaths

Joseph James Kinyoun ⊕ **Major, M. C., U. S. Army,** Washington, D. C.; Bellevue Hospital Medical College, 1882; aged 58; who entered the U. S. Marine Hospital Service in 1886, and resigned from that service in 1902, with the grade of surgeon; professor of hygiene and bacteriology from 1890 to 1892, and of pathology and bacteriology from 1892 to 1899 in Georgetown University, Washington, D. C.; who on account of eminent sanitary services to the Republic of Venezuela was decorated with the Order of Bolivar in 1897; a member of the Association of American Physicians, Association of American Bacteriologists, and American Public Health Association; for many years bacteriologist of the Health Department of the District of Columbia, and on leave to accept commission in the Army; founder and first director of the United States Hygienic Laboratory; director of the H. K. Mulford Company Laboratories, from 1902 to 1907; on duty in the cantonments of North and South Carolina, until Dec. 6, 1918, when he was detailed as pathologist in the Army Medical Museum, Washington; died at his home, February 14, from lymphosarcoma of the neck.

Richard Ernest Kunze, Phoenix, Ariz.; Eclectic Medical College of the City of New York, 1868; aged 80; a practitioner of New York until 1896, also a doctor of pharmacy, and since that time a student and investigator in medical botany and insect fauna, in Arizona; a specialist in cactus; and an exporter from his cactus farm in Arizona of varieties of cactus to botanical gardens in all parts of the world; at one time president of the New York Therapeutic Society and corresponding secretary of his alma mater; author of many monographs on cactus; died at his home, February 10.

James Williamson Squires ⊕ **Capt., M. C., U. S. Army,** Charlotte, N. C.; North Carolina Medical College, Charlotte, N. C., 1911; aged 30; professor of rectal diseases in his alma mater; a specialist on roentgenology; who entered the service, June 16, 1917, and after serving at Fort Oglethorpe, Ga., and Rockefeller Institute, New York City, sailed for France, in August, 1917, and was on duty with the Yale Hospital Unit, November 30; died in the U. S. General Hospital, Toul, France, Dec. 16, 1918, from lobar pneumonia following influenza.

Aaron Shiner Oberly ⊕ **Capt., Med. Dir. U. S. Navy,** retired, Avon, Conn.; Yale University, New Haven, Conn., 1860; aged 81; who entered the navy, July 1, 1861; serving throughout the Civil War; was chief surgeon of the Adriatic Squadron, in 1886; and was retired after ten years and eleven months' sea service, Jan. 4, 1889, with the next higher grade to that held on the active list, on account of incapacity resulting from an incident of service; died at his home, February 15.

John Alfred Bodine ⊕ New York City; University of Louisville, Ky., 1893; aged 53; professor of surgery in the New York Polyclinic Medical School; attending surgeon to St. Johns Hospital, Long Island City, and to the Northwestern and Northern Dispensaries; a specialist in surgery; visiting surgeon to the Polyclinic Hospital; a fellow of the New York Academy of Medicine; dropped dead from heart disease in the New York Athletic Club, February 24.

Bedford Wagoner Russell ⊕ **Lieut., M. C., U. S. Army,** Strong City, Okla.; Epworth College of Medicine, Oklahoma City, Okla., 1909; aged 31; who had been on duty at Fort Riley, Kan., and was ordered to the U. S. Army General Hospital, Fort Des Moines, Iowa, for observation and treatment, January 3; and was discharged from the service, February 6; died at the home of his mother in Oklahoma City, February 13, from the effects of influenza.

⊕ Indicates "Fellow" of the American Medical Association.

Died in the Service
IN NORTH RUSSIA
LIEUT. RALPH E. POWERS, M. C.,
U. S. ARMY, 1890-1919

Elton Bane Rogers ⊕ **Capt., M. C., U. S. Army,** Winchester, Idaho; Northwestern University Medical School, Chicago, 1907; aged 38; who after entering the service, was sent to the University Hospital, Philadelphia, for instruction, later to Camp Dix, N. J., and then on to Hoboken, N. J., May 25, 1918, for overseas duty; formerly local surgeon of the Milwaukee system at Dear Lodge, Mont.; died recently in France.

Elijah Stephens Kelley, Minneapolis; Rush Medical College, 1878; aged 72; at one time a member of the Minnesota State Medical Association; for four years health commissioner of Minneapolis; for one term police surgeon, and once physician of Hennepin County; died at his home, February 6, from influenza.

Andrew Aloysius Conlon, Chicago; Bellevue Hospital Medical College, 1885; aged 57; at one time a member of the Illinois State Medical Society; for nineteen years a member of the medical staff of the Chicago Department of Health; died at his home, February 19, from chronic parenchymatous nephritis.

Charles Newell Palmer, Lockport, N. Y.; New York University, New York City, 1865; aged 77; attending physician to the Lockport Tuberculosis Dispensary, and consulting physician to the Sister's Hospital, Buffalo; a member of the Medical Society of the State of New York; died, February 3.

Harold William Brown ⊕ **Lieut., M. C., U. S. Army,** Jersey City, N. J.; Cornell University, New York City, 1908; aged 32; on duty at Camp Leach, Washington, D. C., was found dead Nov. 3, 1918, from asphyxia, due to chloroform inhalation, self-administered, while in a state of melancholia.

Azariah Kinyon Jewell, Columbus, Ohio; Detroit College of Medicine and Surgery, 1905; aged 40; at one time a member of the Ohio State Medical Association, and local surgeon of the Cincinnati, Hamilton and Dayton Railroad; died at his home, January 9, from pneumonia following influenza.

Daniel Avery Langworthy, Minneapolis; College of Physicians and Surgeons in the City of New York, 1860; aged 87; captain of the 85th New York Volunteer Infantry during the Civil War; a pioneer lumber dealer of North Dakota; died at his home, January 14, from cerebral hemorrhage.

John Irwin Warder ⊕ Weston, W. Va., University of Maryland, Baltimore, 1879; aged 62; president of the Lewis County Medical Society; for three terms mayor of Weston, and once a member of the legislature from Lewis County; died at his home, February 9, from heart disease.

Ralph Edgar Powers ⊕ **Lieut., M. C., U. S. Army,** Akron, Ohio; Eclectic Medical Institute, Cincinnati, 1915; aged 28; on duty with the American Expeditionary Forces in North Russia, and senior medical officer of the 337th Ambulance Company, 339th Infantry; died, January 22, from wounds received in action.

John Alexander Lyons ⊕ Chicago; Long Island College Hospital, Brooklyn, 1889; aged 65; a member of the American Association of Obstetricians and Gynecologists; surgeon and gynecologist to the Chicago Hospital; died at his home, February 18, after an operation for appendicitis.

William B. Callender, Stockton, Kan.; Drake University, Des Moines, Iowa, 1887; aged 63; at one time a member of the Kansas Medical Society; for twenty-six years local surgeon for the Missouri Pacific system; died in the Concordia (Kan.) Hospital, February 5.

George Heman Sadelson, Charlotte, N. C.; University of Buffalo, N. Y., 1876; aged 64; a member of the Medical Society of the State of North Carolina; a specialist on dermatology and tuberculosis; died at his home, February 10, from influenza.

Henry Nollner Rosser, Birmingham, Ala.; Emory University, Atlanta, Ga., 1869; aged 76; a member of the Medical Association of the State of Alabama; for eight years health officer of Jefferson County; died at his home, January 24.

Willis Henry Maxson, Oakland, Calif.; University of Michigan, Ann Arbor, 1883; aged 63; at one time a member of the Medical Society of the State of California; died in a sanitarium in Berkeley, Calif., February 4, from heart disease.

Levi Hornor ⊕ Wichita, Kan.; Kansas City (Mo.) Medical College, 1886; aged 62; for several years physician of Sedgwick County and a member of the local board of education; died in a drug store in Wichita, February 6, from heart disease.

Charles Nicholas Van Denberge, Philadelphia; Albany (N. Y.) Medical College, 1897; aged 41; at one time a member of the Medical Society of the State of New York; died in Philadelphia, January 22, from acute pyonephritis.

Charles Orth, Rock Creek, Ohio., formerly of Pittsburgh (license, Allegheny County, Pa., 1881); aged 99; surgeon of U. S. Volunteers throughout the Civil War; died at the home of his son, in Rock Creek, January 29.

Earl Lawrence Uhl ⊕ Baldwin City, Kan.; Rush Medical College, 1911; aged 33; a specialist on diseases of the ear, nose and throat; died at his home, February 10, from empyema following pneumonia.

William E. Poulton, Washington, D. C.; Georgetown University, Washington, D. C., 1864; aged 79; a member of the Medical Society of the District of Columbia; died at the home of his son, February 14.

Edward Sartor Stewart ⊕ **Lieut., M. C., U. S. Army,** Summertown, Tenn.; Vanderbilt University, Nashville, Tenn., 1911; aged 32; died at Camp Greenleaf, Ga., Oct. 19, 1918, from left lobular pneumonia.

Julian Rush Sutton ⊕ Black Mountain, N. C.; University of the South, Sewanee, Tenn., 1904; aged 38; died in the Mission Hospital, Asheville, N. C., Oct. 30, 1918, from pneumonia following influenza.

Guy Clayton Bowe, Cleveland; Northwestern University Medical School, Chicago, 1895; aged 49; a member of the Ohio State Medical Association; died at his home, February 5, from pneumonia.

Samuel H. Robertson, Crisfield, Md.; University of Maryland, Baltimore, 1853; aged 85; for several years superintendent of the public schools of Somerset County; died at his home, February 21.

John S. Rome, Los Angeles; University of Michigan, Ann Arbor, 1866; aged 78; formerly a resident of Calmar, Iowa, and a member of the Iowa state legislature; died at his home, about February 5.

Herbert Lawson Williams, Pittsburgh, Pa.; University of Pittsburgh, 1918; aged 24; died in the Ohio Valley General Hospital, Pittsburgh, February 3, from the effects of a gunshot wound.

John M. West; Red Bluff, Calif.; Rush Medical College, 1864; aged 82; formerly a member of the Medical Society of the State of California; died in Red Bluffs, Calif., February 10.

John D. Hess ⊕ **Capt., M. C., U. S. Army,** Clarkton, Mo.; Washington University, St. Louis, 1900; aged 41; on duty at Fort Bliss, Texas; died, Oct. 17, 1918, from pneumonia.

James Wiltse ⊕ Brewster, N. Y.; Bellevue Hospital Medical College, 1890; aged 54; health officer of Putnam County; died at his home, February 2, from lobar pneumonia.

Andrew B. Lennington ⊕ Maybee, Mich.; Detroit College of Medicine and Surgery, 1900; aged 51; died suddenly at his home, February 6, from intestinal obstruction.

John Awvill Pennington ⊕ **Lieut., M. C., U. S. Army,** New York City; University of Tennessee, Nashville, 1918; aged 26; died, October 4, 1918, from influenza.

Jay Amherst Latimer ⊕ Claremont, Calif.; Cleveland College of Physicians and Surgeons, 1898; aged 44; died at his home, January 24, from pneumonia.

Mary Henrietta Rowland, Davenport, Ia.; Hahnemann Medical College, 1866; aged 68; died at her home, February 7, from nephritis.

Luman L. Wescott, Chicago; Chicago Homeopathic Medical College, 1898; aged 52; died at his home, February 11, from arteriosclerosis.

Henry W. Shirley ⊕ Shoals, Ind.; Medical College of Ohio, Cincinnati, 1878; aged 76; died at his home, January 28, from angina pectoris.

Solomon W. Biddinger, Hartsville, Ind. (license, Indiana, 1897); aged 85; a practitioner since 1857; died at his home, about February 6.

The Propaganda for Reform

IN THIS DEPARTMENT APPEAR REPORTS OF THE COUNCIL ON PHARMACY AND CHEMISTRY AND OF THE ASSOCIATION LABORATORY, TOGETHER WITH OTHER MATTER TENDING TO AID INTELLIGENT PRESCRIBING AND TO OPPOSE MEDICAL FRAUD ON THE PUBLIC AND ON THE PROFESSION

PHARMACEUTICAL MANUFACTURERS AND "PRIVATE FORMULA" PRODUCTS

To the Editor:—American makers of pharmaceuticals have for many years considered it commercially ethical to make legitimate pharmacal products according to so-called "Private Formulæ" submitted for manufacture by reputable physicians and druggists for their own dispensing. To do otherwise would be an untenable refusal on the part of the manufacturer to serve the interests and supply the needs of a rather large clientele through his laboratory. Logically in these transactions the manufacturer's obligations begin and end with the correct manufacture of the product and the use of the materials specified by the patron. To hold the manufacturer even remotely responsible for the ultimate dispensing or distribution of such products manifestly would be an impossible requirement.

Our inflexible rule is that all such "Private Formulæ" orders as are evidently intended for public distribution and not for personal dispensing by physicians or druggists, are positively refused acceptance until the "copy" for the "literature" has been critically studied by experts on our New York office staff. This is particularly true of all such orders coming from Spanish-speaking countries where it appears to be the fact that misrepresentations and exaggerations in such "literature" are not so critically censored as in the U. S. A.

The head of our Spanish Export Department personally censors all such "copy"; in his absence this is done with equal care by his first assistant. Naturally we must depend on the loyalty and integrity of these business associates for a correct translation into English and a rigid censorship of all such "copy" since we ourselves are not intimately familiar with Spanish. Probably at the present time, now that you are issuing a Spanish edition of THE JOURNAL, your own dependence on Spanish-speaking colleagues for ethical accuracy and the avoidance of error is keenly appreciated by the editorial staff of THE JOURNAL.

We have never knowingly accepted or filled an order for a product the ultimate disposition of which was to be accomplished through misrepresentation or fraud. For years we have had two druggist patrons in Arecibo, Porto Rico—both men of good repute; both patrons submitted orders for "Private Formulæ" products in 1915. Three such products were ordered; each order was accompanied by "copy" in Spanish to be used by us for them on the labels and circulars.

The head of our Spanish Export Department was away on a commercial trip in Latin-America when these orders arrived in New York. His first assistant was temporarily ill. His second assistant, a Spanish-speaking man, took the responsibility of passing on this "copy" and he O.K.'d it as being correct and in compliance with our rigid rules as to accuracy of statement and these orders with these pieces of "copy" in Spanish were sent by him to our Private Formula Department at Baltimore. The superintendent of that department at Baltimore, knowing nothing of the absence from New York of the head of the Spanish Export Department and therefore naturally assuming that these pieces of Spanish "copy" had been properly censored, accepted these orders in good faith.

The goods were made up, labeled with the Spanish "copy" and were shipped to our Porto Rican patrons. On their arrival in Porto Rico they were inspected by American experts and these inspectors at once determined from the printed matter on and around the packages that the products were "misbranded" and in due time, we, as the manufacturers, were notified to that effect. The moment we saw for the first time an accurate translation of the Spanish "copy" we recognized the fact that we had been misled by our Spanish office assistant and promptly discharged him for the offense.

To facilitate the removal of the cases from the docket and at the urgent solicitation of our attorney and with the concurrence of the court we paid the nominal fine in each case, which later on was refunded to us by the customer. At the same time we notified these two patrons that we insisted on their withdrawing the three products from the market until every package was redressed with new labels and circulars in the wording of which none but true statements were to appear. It is to the credit of both men to say that both cheerfully acquiesced and both had every package redressed properly before a single package was offered for sale.

Our reason for inflicting this lengthy communication on your readers is that through the publication in Volume 72 of THE JOURNAL (see page 60, Jan. 4, 1919) Sharp & Dohme is by inference held out as being *particeps criminis* and as the originators and promoters of these three undoubtedly "Misbranded Nostrums." The injustice of that inference must appeal at once to all fair-minded men who through reading the foregoing statement of absolute facts must concede that we were and are innocent of any intentional cooperation with this "misbranding."

Therefore it is with a keen appreciation of your fairness to all houses of good repute that we ask that you give this communication a place in the widely read JOURNAL, thereby affording us an opportunity of putting ourselves in the right light before the large group of ethical physicians whom we have honestly served for so many years and whose respect and confidence we feel that we can justly expect to retain.

SHARP & DOHME.

P. S.—The subjoined imprint appears on every invoice of "Private Formulæ" preparations:

"We hereby guarantee that the Private Formula preparation here invoiced was made according to the formula furnished to us. It is mutually agreed that we are not responsible for its disposition nor for any claimed medicinal action.—SHARP & DOHME."

[COMMENT.—The letter above is published because the house of Sharp & Dohme, as a reputable business concern, feels that it has been done an injustice by the publication of three brief items, abstracted from federal reports. These reports, of course, gave no hints of the fact that these preparations were "private formula" products. THE JOURNAL is willing to admit that there was a possible injustice done Sharp & Dohme in that its readers would naturally infer that these three misbranded "patent medicines" were *sold under the name of* Sharp & Dohme, instead of *being made by* Sharp & Dohme, to be sold by some one else. There is, unfortunately, a commercial distinction between these two facts; whether or not there is any moral difference between profiting by the manufacture of a "patent medicine" that is to be retailed by somebody else, and selling the same medicine under one's own name, is a question that may safely be left to the medical profession to answer.—ED.]

MORE MISBRANDED NOSTRUMS

Alkavis.—Shipped, June, 1915, by M. Agnes Jamieson, trading as the Alkavis Co., Detroit. Analysis showed the preparation to be essentially a solution containing potassium nitrate, sodium benzoate, glycerin, and vegetable extractives. Falsely and fraudulently represented as a remedy for diseases of the kidneys, liver and urinary organs. Fine, $50.—[*Notice of Judgment No. 5247.*]

Sulferro-Sol.—Shipped in November, 1917, by the Sul-Ferro-Sol Co., Inc., Birmingham, Ala. Falsely and fraudulently represented as a remedy for pellagra, kidney and bladder trouble, rheumatism, tuberculosis of the bone, etc. Court entered judgment of condemnation and forfeiture and ordered that the product be destroyed.—[*Notice of Judgment No. 6087.*]

"Gonorrhea and Gleet 3 Day Cure"; "Old Indian Fever Tonic"; "Pain-I-Cure"; and "Walker's Dead Shot Colic Cure."—Shipped in February, 1916, by the Walker Co., Atlanta, Ga. The "Gonorrhea and Gleet 3 Day Cure," when analyzed, appeared to be a solution of zinc sulphate and sulphocarbolate, boric acid, opium and hydrastin. The "Old Indian Fever Tonic" appeared to be a solution of Epsom salt and quinin sulphate, acidified with aromatic sulphuric acid, and colored red with coal tar dye. "Pain-I-Cure" contained over 74 per cent. of alcohol with morphin, red pepper, camphor, and oils of sassafras and cloves. "Walker's Dead Shot Colic Cure" contained over 77 per cent. of alcohol with essential oil, asafetida, guaiac, morphin, camphor, and red pepper. All four products falsely and fraudulently represented. Fine, $50 and costs.—[*Notice of Judgment No. 5781.*]

Correspondence

POSTINFLUENZAL DISTURBANCES OF THE NERVOUS SYSTEM

To the Editor:—Postinfluenzal diseases of the cerebrospinal axis are of common occurrence. They followed in the wake of the last great epidemic and were well described at that time. That there can be a primary invasion of the nervous system, the general signs of an infection being secondarily determined, does not seem from recent observations of mine to be sufficiently kept in mind. In the last two months I have seen in consultation or have had referred to me patients who presented syndromes which at first did not seem to have any connection with our present epidemic: 1. They had not been preceded by bronchial or respiratory symptoms or by temperature elevation. 2. Most of these patients, however, complained of neuralgic pains, headaches or drowsiness almost from the beginning. 3. A slight increase of the body temperature, accompanied as a rule by no rise of the pulse rate, by a low blood pressure and by the characteristic inertia of mind, has followed the paralyses, etc. These general signs have been observed as a rule on about the fourth or fifth day of the disease. 4. A lymphocytosis of the cerebrospinal fluid has been invariably reported. This has varied from 22 cells (paralytic chorea syndrome) to 192 cells (general paresis syndrome). 5. All patients have had a fairly acute onset and recovery has been the rule.

I wish to record briefly certain instructive observations:

One patient presented himself with pronounced twitchings and fibrillary tremor, bleating speech, Argyll Robertson pupil and a dementia. The onset was acute. There was no ethical deficit as in true paresis, however. Nor was there the ever-present erethism or depression of the true paralytic dementia. Two days after I first saw this patient, a rise in temperature was observed and the ordinary influenza symptoms came on. In two weeks, he commenced to recover. His memory returned, his tremors subsided, his speech bettered itself, and his eyes reacted again to light. It was in this patient that a lymphocytosis of 192 was reported.

The frequency of encephalitis unaccompanied by frank meningitic symptoms has been reported before. Multiple cranial palsies without a previous history of infection have been observed by me in five consultations during the last two months. In no case were bulbar symptoms present. Their onset was acute. A diplopia seems to have preceded all other symptoms. The uniform recovery in these cases excludes a hemorrhagic type of encephalitis and would indicate a toxic basis. All the patients were apathetic, inert and dull for the several weeks it took the paralyses to clear up. Two of them developed a fever with a drop of blood pressure a few days after the initial paralysis. All had a lymphocytosis. In one case, Pfeiffer's bacillus was reported on culture. The symptoms varied somewhat, but included ptosis of the eyelid, diplopias of various types, facial paralysis, and brachial paresis. All the patients had a miosis, a failure of the accommodation reflex, and an almost absent pupillary light reaction. Absent reflexes on one or both sides of the body were noted. I imagine that transient diplopias must have been very common from conversations with various general practitioners. Ophthalmoplegia after or during infections is, of course, a commonplace. At present these toxic ophthalmoplegias and diplegias are occurring in too large a number not to be significant in connection with the present epidemic.

I have noticed also an unusual number of unilateral choreas this winter with pronounced paralytic symptoms. Have they any connection with influenza? I have not been able to study them from the laboratory standpoint to have an opinion.

I was confused in two cases by a close similarity in symptoms to cerebrospinal syphilis. Mental dulness, with a facial diplegia or a brachial monoplegia and oculomotor paralyses, accompanied by a lymphocytosis, does not always represent a syphilitic picture. The difference lies in the absence of a premonitory period, the comparative absence of a general breakdown preceding the onset of the palsies, and the early and pronounced mental dulness. The palsies were not so fugacious as in true cerebrospinal syphilis and disappeared more progressively; and, of course, the Wassermann and colloidal gold tests are always negative, despite the increased lymphocytosis. Both patients had an accommodation spasm with miosis.

EDWARD E. MAYER, M.D., Pittsburgh.

"OHIO FINDS A BETTER WAY"

To the Editor:—Allow me to congratulate you on the stand you take in endorsing the action of the Ohio State Medical Association on throwing the responsibility of public health on the legislature by not opposing bills licensing certain cults and sects.

During the last thirty years while going to the legislature opposing bills of the osteopaths, Christian scientists and the like, I came to the conclusion that the best way to deal with them is to ignore them.

L. W. ZWISOHN, M.D., New York.

A PROTEST AGAINST THE SENDING SOUTH OF INDIGENT TUBERCULOSIS PATIENTS

To the Editor:—May I protest against physicians in other parts of the country telling indigent tuberculous patients to go South for the winter? For the past few years, an average of thirty transient tuberculous people have died each year in our community. We have no proper place as yet to care for our own tuberculous, and the migratory consumptive adds greatly to our problem. Plans are under way for a county sanatorium at Jacksonville. There is no state institution and at present no private institution in Florida for the care of tuberculosis.

WILLIAM W. MACDONELL, M.D., Jacksonville, Fla.
City Health Officer.

THE SUPPLY OF PRACTICAL NURSES

To the Editor:—Since the necessity of presenting a nursing bill at the present session of the Illinois legislature became known, an honest effort has been made to try to remove some of the nursing difficulties of the state. To help overcome the shortage of nurses, the course of thirty-six months for the registered nurse has been cut down in a proposed bill to a minimum of twenty-seven months, and a course of eighteen months established for a new group, this also to be registered.

To assure the eighteen months' nurse being kept for the bedside care of the sick, a restriction preventing her doing public health work, acting as a supervisor, instructor or executive, has been made. This seems worth trying, as one great cause of the shortage of the private duty nurse is her absorption into other forms of nursing.

The need of a part nurse, part housekeeper in the home is fully appreciated, but it seemed unwise to incorporate in a possible law a type that had not yet been successfully developed. Long observation seems to show that most private duty nurses, after the first enthusiasm wears away, either are unwilling to do household duties or get discouraged and give up private duty. The advice of the women at the head of the homes would be valuable as to the practicability of one woman continuously nursing the sick and caring for the home at the same time.

It seemed equally unsound to introduce into a law the experimental short course nurse, with the fear of sending into the field many but poor nurses; and out of consideration for the hospitals whose sick need equal consideration, eighteen months as the shortest period was finally settled on.

The effort of carrying a registered nurses' school has undoubtedly become burdensome to some hospitals, and it is unjust that those institutions should have to carry heavy educational problems in addition to their many responsibilities or be considered not accredited. It has been thought that with the two groups of women, hospitals might decide which type of school they wished to conduct—the registered nurse school with the expense of many instructors and equipment, or junior registered nurse school, equally dignified and important, giving in eighteen months an intensive instruction to qualify for good bedside nursing care, having class instruction in practical nursing, invalid cooking, personal and home hygiene, and possibly a little anatomy and physiology.

The name of Junior Registered Nurse was not given in a feeling of patronage or to indicate inferiority either for the school or for the woman. It is usually granted that a twenty-seven months' course is more advanced than an eighteen months' period, and it is in this sense alone that the term was applied. The words Junior Registered Nurse also indicate that, should the woman care to, she may at some time qualify for Registered Nurse. Neither the Registered Nurse nor the Junior Registered Nurse will carry the title Registered around with her, and both will be called nurse. Restrictive clauses specifying those who may nurse for hire will make it a mandatory law if passed.

While most nurses advise against an entrance age under 21, practical reasons and public demand have placed the age at 19. It has been thought that in this age of general education one year high school entrance has not been too much to ask.

The other points of the bill deal with administration. The majority of the registered nurses in Illinois have endorsed this bill as a possible solution of a difficult situation. It cannot be attempted or successfully worked out without the cooperation of every interested person, the medical profession to understand and interpret it to the community, the nurses realizing the opportunity to perform a valuable service by developing and welcoming this second group of registered nurses and the department of the state, under which the schools will be administered, exercising a just control.

M. H. MCMILLAN, Presbyterian Hospital, Chicago.
President, Illinois State Association of Graduate Nurses.

[Dr. M. L. Harris, representing the Illinois Hospital Association, comments:]

To the Editor:—The people have long experienced difficulty in securing nurses who are willing to wait on the sick, and the seriousness of the situation was greatly accentuated during the recent epidemic. Not only is there a shortage of nurses, but there is a growing tendency on the part of the registered nurse to escape doing private duty or actual nursing. Both of these facts have been recognized by the people, who are demanding that something be done to remedy the situation.

The nurses' organization recently introduced into the legislature of Illinois a nursing bill which they believe to be "an honest effort to try to remove some of the nursing difficulties of the state." If its proposed bill will remove the existing difficulties and enable the sick to secure some one to wait on them during their illness, it is a good bill; but, if it does not remove the difficulties, then some bill should be substituted for it which will.

Referring to its bill, it is casually remarked in the preceding letter that "restrictive clauses specifying those who may nurse for *hire* will make it a mandatory law if passed." The first paragraph of the proposed law provides that it shall be unlawful for any person to nurse the sick who is not a registered nurse or a junior registered nurse. The question of "hire" does not enter into the bill. A person could not render even gratuitous service to the sick; not only that, but the bill would prevent Sisters, deaconesses and brothers

of religious organizations that conduct hospitals from nursing the sick either in their hospitals or in the patients' homes, and would likewise exclude from nursing all male nurses and all unregistered nurses, even though graduates, unless they chose to register—and many of them do not so elect—and all practical nurses, however great the necessity for their existence may be, and however great the good that they may do.

The number of sick persons well cared for every day by these large groups amounts to thousands. Under the proposed bill, it would be imposible for these suffering sick to obtain any one to take care of them, either for hire or as a gratuitous service, unless they were able to secure the services of a registered nurse. Unfortunately there are not enough registered nurses to meet the demand; hence under the proposed law at least nine out of ten of the sick would be compelled to be without a nurse's care, except such as might be rendered them by members of the family.

Could a law that would make it impossible for a sick person to secure some one to wait on him during his illness be considered anything but inhuman? It is proposed to help this situation by establishing a new group of nurses to be given an eighteen months' course of training, and to be known as Junior Registered Nurses.

These Junior Nurses are to be the real nurses of the sick. They are to do all the actual work, while the registered nurse is to do all the supervising. Note the wording of the letter: "To *assure* the eighteen months' nurse being *kept* for the bedside care of the sick," the law is to prevent her from doing anything else. Under the proposed bill the registered nurse is permitted to do all the supervising and executive work, all the teaching and instructing, all the institutional work, and all the public health work; in other words, all the supervising, while the Junior Nurse is made to do all the waiting on the sick. The bill reads as follows: "A Junior registered nurse may nurse the sick or disabled, but may neither engage in public health nursing, act in a supervisory capacity, in a hospital or similar institution, act as an instructor or in a supervisory capacity in a school of nursing, nor act as an instructor or in a supervisory capacity in public health service or any other like service." Moreover, she is not permitted to nurse in a hospital except "when under the immediate personal supervision of registered nurses."

The slave was chained to the galley for life, but that was centuries ago. Can it be that we are returning to that age? Is it possible that the law is to be invoked to create class, to keep a person to a particular work, and to prevent the person from doing anything else? No matter what the Junior Nurse's ambitions may be, no matter what her ability as a teacher, as an instructor, as a supervisor or as an executive, may be; no matter what her aptitude for public health service may be, she is to be prohibited by law to do any of these things or any other similar things.

What evidence is there that "the effort of carrying a registered nurse school has undoubtedly become burdensome to some hospitals"? The hospitals own and maintain practically all of the training schools. Hospitals are conducted for the welfare of the sick, and nursing is essential to their welfare. It is desirable that the expense connected with the care of the sick should be maintained at the lowest point consistent with the highest type of service. A training school in connection with a hospital is the most economical way of providing the best nursing for the sick; then why should hospitals wish to give up their training schools when they know that the expense of caring for their sick would thereby be greatly increased? There is no objection to any hospital prescribing its own qualifications and giving courses of any length which it may desire in order to produce the highest type of instructors, public health and social service workers, and the like; but the people demand and must have some one to care for them when they are sick, and the hospitals, through their training schools, must supply the demand.

True, the preceding letter states that "the words Junior Registered Nurse also indicate that should the woman care to, she may at some time qualify for registered nurse." The words are the only thing that indicate it, for the law makes no provision for her ever becoming anything but a Junior Nurse. That the present day registered nurse is not waiting on the sick is shown by the statement that "one great cause of the shortage of the private duty nurse is her absorption into other forms of nursing." What are "these other forms of nursing"? Institutional work, supervising the work of others, public health work, social service work, etc., most of which are not forms of nursing at all. Not that this line of work is not most valuable and important, for it is, and should be encouraged and extended; but if the registered nurse does not care to wait on the sick, let us have some one who does. Because the registered nurse does not care to nurse the sick, she has no right to say that others who wish to shall not nurse, nor has she any right to say that that nursing shall be done only under her supervision.

If the present day system of training the registered nurse is unfitting her for private duty nursing, then there is something wrong with the system, or something wrong with the individuals doing the training. No one familiar with the subject will attempt for a minute to deny that there is a large field for the well trained, well educated specialist in nursing; nor would any one think of restricting or hindering the progress and development of those who are interested in this line of work; but what the great mass of people need and demand is a nurse who will wait on them when they are sick, and who will carry out the orders of their physician.

The proposed bill which the Nurses' Association has presented not only does not supply this great need, but it deprives the people of much of the service along this line which they now have.

M. L. HARRIS, M.D., Chicago.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

"ROACHES IN A SANATORIUM"

To the Editor:—Referring to a recent query (THE JOURNAL, Feb. 15, 1919, p. 515) as to the best method of exterminating roaches in a sanatorium, it has been my experience that the one best method for ridding an institution of these insect pests is the careful shutting off of their food supply.

All material that might serve as food for hungry roaches should be kept in tins or insect-proof boxes with properly adjusted and tightly fitting covers. When ventilation is necessary for the preservation of foodstuff, covers should be made of wire gauze with moderately fine mesh. No food scraps of any kind should be allowed to lie around after meals, but should be promptly deposited in a metal-covered garbage can.

This is the first and most important step in ridding a badly infested building of cockroaches, and unless it is properly attended to, the use of roach poison frequently does not result in the extermination of roaches.

L. D. FRICKS, M.D., Louisville, Ky.

Surgeon, U. S. P. H. S., Medical Officer in Charge, Camp Zachary Taylor, Civil Sanitary District.

LIMIT OF TAXATION OF OFFICERS' INCOMES

To the Editor:—Please inform me whether or not an officer of the Medical Reserve Corps who has no income other than from the government pay for services is subject to an income tax; that is, is pay from the United States government subject to income tax, or is it exempt?

C. H. OTKEN, M.D., McComb, Miss.

ANSWER.—As indicated under Item 1, Heading III, page 1, of instructions on income tax returns, "Pay not exceeding $3,500 for active service in the Military and Naval Service of the United States" is exempt from income tax. This applies to 1918 income only. According to this exemption, physicians in active service in the Army and Navy need not pay income tax on their salaries unless the amount of the salary for 1918 was more than $3,500.

PENDING LEGISLATION FOR EXTRA PAY

To the Editor:—Has a bill been passed by Congress authorizing the payment of one month's extra salary to officers or men honorably discharged from the Army or Navy? Please omit my name. M. W. R.

ANSWER.—Such a bill has not been passed, although provisions for extra pay are included in pending legislation.

Medical Education and State Boards of Registration

COMING EXAMINATIONS

ALASKA: Juneau, March 4. Sec., Dr. L. P. Dawes, Juneau.

ARIZONA: Phoenix, April 1. Sec., Dr. Allen H. Williams, 219 Goodrich Bldg., Phoenix.

CALIFORNIA: Los Angeles, March 17-20. Sec., Dr. C. B. Pinkham, State Capitol, Sacramento.

COLORADO: Denver, April 1. Sec., Dr. David A. Strickler, 612 Empire Bldg., Denver.

CONNECTICUT: New Haven, March 11-12. Sec. Reg. Bd., Dr. Chas. A. Tuttle, 196 York St., New Haven; Sec. Eclectic Bd., Dr. J. E. Hair, 730 State St., Bridgeport, and Sec. Homeo. Bd., Dr. E. C. M. Hall, 82 Grand Ave., New Haven

DISTRICT OF COLUMBIA: Washington, April 9-11. Sec., Dr. Edgar P. Copeland, The Rockingham, Washington.

IDAHO: Pocatello, April 1-2. Sec., Dr. Ray H. Fisher, Rigby.

ILLINOIS: Chicago, March 3-5. Mr. F. C. Dodds, Supt. of Registration, Springfield.

IOWA: Iowa City, March 24-26. Sec., Dr. G. H. Sumner, Capitol Bldg., Des Moines.

MAINE: Portland, March 11-12. Sec., Dr. Frank W. Searle, 776 Congress St., Portland.

MASSACHUSETTS: Boston, March 11-13. Sec., Dr. W. P. Bowers, Rm. 501, No. 1 Beacon St., Boston.

MINNESOTA: Minneapolis, April 1-4. Sec., Dr. T. S. McDavitt, 741 Lowry Bldg., St. Paul.

MONTANA: Helena, April 1. Sec., Dr. S. A. Cooney, 205 Power Bldg., Helena.

NATIONAL BOARD OF MEDICAL EXAMINERS: Philadelphia, June 2-7. Sec., Dr. J. S. Rodman, 1310 Medical Arts Bldg., Philadelphia.

NEW HAMPSHIRE: Concord, March 13-14. Sec., Dr. Charles Duncan, Concord.

NEW MEXICO: Sante Fe, April 14-15. Sec., Dr. W. E. Kaser, East Las Vegas.

OKLAHOMA: Oklahoma City, April 8-9. Sec., Dr. J. J. Williams, Weatherford.

RHODE ISLAND: Providence, April 3-4. Sec., Dr. B. U. Richards, State House, Providence.

UTAH: Salt Lake City, April 7-8. Sec., Dr. G. F. Harding, Templeton Bldg., Salt Lake City.

Book Notices

UNITED STATES ARMY X-RAY MANUAL. Authorized by the Surgeon-General of the Army. Prepared under the Direction of the Division of Roentgenology. Leather. Price, $4 net. Pp. 506, with 219 illustrations. New York: Paul B. Hoeber, 1918.

Although written to satisfy military requirements, this manual is a rich epitome of roentgenology. For civil purposes there would have been less space devoted to projectile localization, but otherwise the rudiments of the subject are set forth in well-balanced and masterful style. The contents represent the combined work of several of America's most competent roentgen workers, who aimed to furnish the most valuable handbook for military roentgenologists in the making. Their manual will outlast its purpose because it is almost of equal use as a handbook in civil work and has been made available to the civil public.

LES PLAIES DE GUERRE ET LEURS COMPLICATIONS IMMEDIATES. Leçons faites a l'Hotel-Dieu. Par Henri Hartmann, Professeur de Clinique Chirurgicale. Paper. Price 8 francs. Pp. 200, with 58 illustrations. Paris: Masson et Cie, 1918.

This volume consists of a series of eighteen lectures, given by the author at l'Hotel Dieu during the winter semester of 1916 and 1917, in which he endeavored to present as briefly as possible the experiences gained during three years of war. In discussing bullet wounds in general the author states that there is no question that the enemy used explosive bullets; but he does not believe that they were frequently used—not that there were humanitarian reasons but because the explosive bullet does not travel so fast or so far as the full jacketed bullet. In the treatment of war wounds, at least those made by shrapnel, shells, etc., the general principle seems to be fairly well established that the wound should be operated on as soon as possible and all foreign bodies, including tissue débris and the walls of the tract, should be removed, leaving only clean, healthy surfaces, which should be brought together at once in the hope of securing primary union. If this method of treating wounds is thoroughly carried out early, that is, during the first few hours, before infection has well started, the majority of the wounds will heal without suppuration. Even in the case of fractures and wounds of the large joints, this line of treatment may be carried out successfully in a majority of the cases. If infection has already set in, this method of treatment, of course, should not be carried out, so far as the primary closing of the wound is concerned. In discussing shock, the author is inclined to accept Crile's theory. The excellent work done by American investigators at the front on this subject, of course, was not available at the time these lectures were given. The question of the treatment of wounds of the abdomen is still a subject of much discussion. The unavoidable incidental conditions of warfare are so important in this connection that they are largely the determining factor in deciding as to the desirability or not of operating in a given case. The lectures are interesting and instructive in showing what the French surgeons were able to accomplish during the war.

INFORMATION FOR THE TUBERCULOUS. By F. W. Wittich, A.M., M.D., Instructor in Medicine and Physician in Charge Tuberculosis Dispensary, University of Minnesota Medical School. Cloth. Price, $1. Pp. 150. St. Louis: C. V. Mosby Company, 1918.

Dr. Wittich's book is an elaboration of the weekly talks given by the author to patients in tuberculosis sanatoriums and is an effort to answer the questions asked by patients on first learning that they are tuberculous and during treatment for their disease. The fact that the author was himself at one time a patient at Saranac Lake gives him an opportunity of recording his experience both as a patient and as a physician. The advice and information given are in keeping with the best developments of sanatorium treatment.

APPLIED BACTERIOLOGY. Studies and Reviews of Some Present-Day Problems for the Laboratory Worker, the Clinician, and the Administrator. Edited by C. H. Browning, M.D., D.P.H., Director of the Bland-Sutton Institute of Pathology, the Middlesex Hospital. Contributors: C. H. Browning, W. Gilmour, R. Gulbransen, T. J. Mackie, S. Russ, J. F. Smith and L. H. D. Thornton. Cloth. Price $2.50. Pp. 291, with 4 illustrations. New York: Oxford University Press, 1918.

This book deals with the diagnosis of enteric infections, studies on antiseptics and antibodies, tetanus, etc. Much of the material has already appeared in separate papers in British medical journals. The book will be useful to laboratory workers.

Medicolegal

Giving Treatments Regardless of Ailments

(*State v. Fenter* (*Mo.*), *204 S. W. R. 733*)

The Springfield (Mo.) Court of Appeals, in affirming a judgment of conviction of the defendant, a chiropractor, of illegally practicing medicine and surgery, says that he contended that he was entitled to an instruction to the effect that, if he treated or attempted to treat Mrs. Mustain at her request and without any reference to her ailments, or whether she was sick or well, the jury should find him not guilty, and that he requested such an instruction, which was refused. If such a mental attitude on the part of the defendant could be tortured into a defense to the charge of treating the sick and infirm without complying with the law regulating the practice of medicine and surgery, then the law would be practically a nullity. Besides, there was no substantial evidence on which to base such an instruction. The defendant testified that in the particular case of Mrs. Mustain he did some work on her spine with his hands that might be called manipulations, and applied force with his hands to her spine, but did not represent to her that it was a corrective agency, or that it would take five or six or seven adjustments. The evidence further showed that the defendant treated Mrs. Mustain at his office several times, and visited her eight times, and made regular charges. In the defendant's office were an operating or manipulating table, an electrical machine, charts of the spinal column and nervous system, and the backbone of a human skeleton; and at the entrance of the stairway leading to the office was a sign indicating the char-

acter of his business, and a like sign on his office door. Mrs. Mustain went to the defendant for treatment for physical infirmities, and he treated her; and if it were conceded that he did not tell her the purpose or object of the treatment he was giving, that could make no difference. Mrs. Mustain knew the purpose or object intended by the treatment, and that was to give her such relief as the treatment might give. The court thinks that the instruction was properly refused.

Valid Contract of Third Party to Pay Bills

(Meyers v. McKillop (Calif.), 173 Pac. R. 773)

The District Court of Appeal of California, Third District, in affirming a judgment rendered in favor of the plaintiff for services rendered by him as a physician and surgeon, and by his assignors, a Dr. Johnson and the Sacramento Valley Hospital, a corporation, says that the only question was whether the evidence warranted the court in finding that the transaction between the plaintiff and the defendant created an original or primary obligation on the part of the latter, it being the defendant's contention that he was, at most, a guarantor, and that the obligation was void because not in writing. The facts were similar, and the same question was presented in the matter of the two small assigned claims. This court thinks there can be no doubt that the theory of primary liability adopted by the trial court found sufficient support in the record. The services were performed for one Williams, and the plaintiff was called to attend him, October 5. Two days thereafter, according to the plaintiff's testimony, he had the following conversation with the defendant at the Sacramento Valley Hospital:

> I asked him whether he would pay Mr. Williams' bill. I told him I had an understanding he was going to pay the bill, and he said he would. I told him perhaps we had better make the sister feel more easy about the money. When we went down stairs, I repeated the conversation in front of Sister Marie, and the substance was that he was to pay Mr. Williams' bill.

He furthermore testified:

> I made three calls on the 7th; on the 8th three calls; on the 9th there were five calls made; and on the 10th he was operated on by myself, Dr. Johnson and Dr. Wilson. I called on him twice subsequent to the operation; on the 11th I called three times; on the 12th I called four times; and on the 13th three times the day he died.

These services, performed after his conversation with the defendant, were reasonably worth, so he said, the sum of $305, and this was allowed by the court.

It is a fair inference from the foregoing that these services were performed on the reliance that the defendant would pay, and it is also a fair inference that the latter directly promised to make such payment. This constituted an original contract, with a sufficient consideration for its support. It was true that the plaintiff was originally called by one Barnholdt, but there was no evidence that he was employed by the latter or by Williams, or that he looked to either for his compensation. At any rate, this court may eliminate the services performed on the 5th and 6th, as did the trial judge, and consider only what was done after the conversation with the defendant. This may be considered a separate and distinct contract, and this court sees no legal obstacle in the way of enforcing it. It was true that the defendant denied any agreement for the payment of the claim, but the court below obviously did not believe him, and this court cannot say that the want of faith was not justified.

There was a finding, following the allegation of the complaint, that

> Within two years last past plaintiff within the county of Butte, state of California, rendered medical and surgical services to one F. J. Williams at the special instance and request of the defendant, and defendant promised and agreed to pay the value thereof.

The allegation in the complaint was certain and definite enough to withstand the general demurrer which was interposed, and the exact time covered by the services for which the defendant was held liable was revealed by the evidence; the amount found due corresponded exactly with the testimony as to the value of these services; and this court sees no merit in the claim that it did not appear from the findings what period was covered by them.

Society Proceedings

THE INSTITUTE OF MEDICINE OF CHICAGO

Meeting held Feb. 21, 1919

The President, DR. HUGH T. PATRICK, in the Chair

SYMPOSIUM ON INFLUENZA

Epidemiology of Influenza

E. O. JORDAN: The present epidemic has a much higher mortality than has been recorded in any of the other outbreaks of which I have been able to find record. The epidemic of 1890 was more severe than that of 1848, and the present epidemic was more severe than that of 1890. In the state of Massachusetts the deaths in 1890 amounted to 2,500; in the present epidemic, to 15,000—six times as many; and yet the population of Massachusetts had not quite doubled in twenty-eight years. The U. S. Census Bureau in its last report recorded 136,000 deaths from influenza and pneumonia in four years, while during this epidemic there have been from 600,000 to a million deaths from influenza and influenzal pneumonia in the United States since the middle of September. This number of deaths from influenza and influenzal pneumonia does not represent all the deaths due to this infection. I have recorded the number of deaths in the four large cities in the country, deducting the influenzal pneumonia component. These figures are for the month of October alone. In the city of New York there were 1,400 more deaths in 1918 after the influenzal pneumonia component had been deducted, and the same in Chicago, an increase of nearly 600 deaths. In Philadelphia and Baltimore, where the epidemic was more severe, the increase is more marked—an increase of more than 50 per cent. in Baltimore, deducting the influenzal pneumonia component; that is to say, there has been a large number of deaths reported from other causes that really ought to be attributed to influenza. Some of the deaths are reported under organic heart disease. For the month of October, 1917, in New York there were 464 deaths, to 1,228 in the same month of 1918. In Chicago there were 232 in 1917, against 512 in 1918. In Philadelphia the number was almost doubled.

In the number of deaths from pulmonary tuberculosis, there was an increase from 644 to 826 in 1918 in New York, and the same rate of increase occurred in Chicago and Philadelphia.

There were 362 deaths from congenital disease in New York in 1917, against 515 in 1918; 175 in Chicago in 1917, against 225 in 1918, and 107 in Philadelphia in 1917, which total was more than doubled in 1918. It is impossible to tell at this time what proportion of those deaths are due to influenzal infection of the mother, or what proportion to lack of care in the first six weeks of life, so that altogether the increase amounts to about 7 per cent. of the reported deaths from influenza and influenzal pneumonia in the largest three cities of the country.

Another matter on which a good deal of comment has been made has been the remarkable age incidence of influenza. In the week of maximum mortality in Chicago, the deaths between the ages of 20 and 30 were more than fifteen times as many as in the corresponding week of 1917. In the period from 5 to 10 there were 5.8 times as many deaths as in the corresponding week of 1917. This method of record is different from the one usually employed in that it shows the actual increase in deaths at all ages from influenza. There has been a marked increase not only from 20 to 30, but also at definite ages below 20. It has sometimes been suggested that the reason for the high mortality of the disease in the 20 to 30 group has been that this group did not show the effect of immunity from the preceding epidemic of 1890, while in those ages over 30 the patients might have had the disease in 1890 and so were protected against the present infection. That cannot be a true explanation. There are a number of reasons for that, and one of them comes out here very plainly. In the 30 to 40 age group, the members of which might have had the infection in 1890-1893, the mortality is considerably higher than in the 10 to 20 groups, where no such immunity

could possibly exist. That comes out more strongly in the six weeks' maximum mortality, in which in the 30 to 40 age group the excessive deaths were 6.5, while in the 10 to 20 group the mortality was only 4.8, showing a much higher mortality in those who might be supposed to have had influenza in 1890.

In general, about one third of the whole population of the country seems to have been attacked. This tallies very closely with what has been observed in other epidemics. About 2 per cent. of those attacked with influenza died. This would give about 30,000,000 cases of influenza with 600,000 deaths.

One other point may be of interest in respect to the occurrence of this disease in two of our groups designated by A and B. This refers to two divisions of the Students' Army Training Camp of the University of Chicago last fall, living under the same conditions, housed in fraternity houses, remodeled apartment places, etc. In Section B, ninety-two cases of influenza occurred in about six days. During the corresponding period only twenty-six cases occurred in Section A. The difference between the two groups is briefly this: Section B was composed of men who came to Chicago from various small towns in Illinois about the middle of October. Three of them were ill on their arrival in Chicago. Other cases developed very shortly, so that in six days there were ninety-two cases. Section B was not brought to the attention of the university authorities for four or five days, and the men who were ill were in contact with the others during this period. The difference between the conditions in Section B and in Section A was that in Section A from the onset the men were under the closest supervision, and those who were slightly ill were at once removed; the results were that all through the epidemic these were only slightly affected. The two groups were exactly similar as regards housing and as regards care, except that the men who were ill were allowed to remain in contact with the others in Section B, while in Section A those who were ill were at once isolated.

Influenza at Camp Taylor

DR. W. W. HAMBURGER: The epidemic lasted from Sept. 22 to Oct. 25, 1918. From the latter date on, sporadic cases came in. Up to December 17 we had 12,742 cases with 822 deaths, a mortality of 6.45 per cent. During the period of the epidemic there were 72,000 troops in camp; the gross mortality, therefore, was 1.14 per cent.

We had at one time a 9,000 bed hospital. We had from 500 to 1,000 new cases every day. We had about 250 cases of pneumonia developing a day. Our highest death rate was 80 in twenty-four hours. We had from 150 to 200 medical officers and from 300 to 500 nurses. We had a pneumonia ward of 2,000 beds. We had a ward of from 3,000 to 4,000 beds for new cases of influenza, and a ward of from 1,500 to 2,000 beds for convalescent patients. These three hospitals were under the direction of the chief military head of the hospital. We had to plan twenty-four hours ahead so as to arrange for new beds.

The height of the epidemic was reached nine days after its beginning. Then there was a drop, a pseudocrisis, a secondary rise, and then a permanent drop. The pneumonia curve is interesting. In the early cases the patients died on an average in three days. Toward the height of the epidemic the duration of the pneumonia was increased from three to four days, showing a prolongation of the pneumonia period, as the result, perhaps, of the patients making a better attempt to fight the disease. The chronological chart of necropsies shows the change in the general pathologic picture from week to week. There was a change in the involvement of the liver, as shown in the increase of hemorrhagic hepatitis. There was a change in the suprarenals, first showing hemorrhage, and the second stage showing congestion. The proportion of lobular pneumonia, that is, the hemorrhagic type, was very great in the first week. This was followed later by an empyemic picture with less hemorrhage. Changes were found in the terminal ileum and transverse colon, an ileitis. These were found in the first week particularly in cases with blood in the stools. In the skin we found quite regularly a condition like the one found in the ileum, a vesicular eruption. Cultures showed staphylococcus. Three conclusions were arrived at from our study of this disease:

1. Influenza is a disease that involves the entire body, involving the head and head sinuses, brain and meninges rather regularly. It involves the entire pulmonary tract, as shown by the hemorrhagic bronchitis and pneumonia. It involves the abdomen, as shown by the cloudy swelling of the liver, kidney and spleen, and by the clinical picture of hemorrhage, and the condition of ileum and colon. It involves the skin, as shown by the vesicular eruption. The pneumonia that develops is the most important thing. From our observations influenza is a generalized process, particularly striking, with an involvement rather constantly of all the sinuses of the head.

2. Influenza, as we saw it, was a progressive disease. The picture of the first week was quite different from that of the second and third weeks. In the first week the tendency to hemorrhage was striking, there being hemorrhagic sputum and hemorrhage from the lungs and the bowels. As immunity was established, this hemorrhagic tendency became less. Our conclusion from this was that the very early infection was very violent and the efforts of the tissues to withstand the disease was evidenced by the hyperemia. In the first week the patients died within twenty-four hours, showing a generalized hyperemia. In the second and third weeks this condition changed to a consolidation in the lung.

3. The early cases showed rather strictly the influenza bacillus. In the second and third weeks the Pfeiffer bacillus in the sputum was taken over by the pneumococcus. Recent laboratory tests in the new cases disclose an increased number of influenza organisms in the sputum and postmortem cultures. The necropsies in five cases made early in the epidemic showed Pfeiffer's bacillus with no other organisms, while ten cases in the fourth week showed pure pneumococcus with no influenza bacilli. From this we concluded that if the influenza bacillus was found, it might be an indication of the disease, but nothing else.

Bacteriology of Influenza

DR. D. J. DAVIS: A real contribution will be made to bacteriology if the present epidemic enables us to establish the relation of Pfeiffer's bacillus to influenza. In the epidemic of 1918 I examined sixty two cases, in which the influenza bacillus was present in 8 per cent. In the epidemic of so-called grip in 1905, I examined seventeen cases, in which the bacilius was present in 17 per cent. In another epidemic of so-called grip—I do not call these cases real influenza—in twenty-three cases the influenza bacillus was present in 18 per cent. In twenty-six cases of ordinary pneumonia examined in the 1908 series, the bacillus was positive in 38 per cent. In lobar pneumonia the bacillus was positive in 33 per cent. In sixty-eight cases of pertussis it was present in 89 per cent.; in measles in 56 per cent.; in varicella, in 64 per cent. It is an interesting fact that in chickenpox these organisms were often present, and certain investigators have found them in 100 per cent. In eleven cases of acute articular rheumatism, the bacillus did not occur. In pneumococcic meningitis, the bacillus was present in 11 per cent.; in 300 cases of tonsillar crypts, it was present in 1 per cent.; in normal throats, it was present in 10 per cent. I take these results as comparative. I am not prepared to say that I found the influenza bacillus present in all cases, but I think they are comparable because the same method was used in all these examinations.

The reports of the present epidemic gave a very considerable percentage of Pfeiffer's bacillus in lung punctures and postmortem material, the percentage of some observers reaching 70 or 80. Pfeiffer himself has not been able to find the bacillus with any degree of constancy in this epidemic. It is interesting to note that the Germans and Swiss lay more stress on the diplostreptococcus than on Pfeiffer's bacillus, while England laid more stress on Pfeiffer's bacillus. A few studies on the presence of specific antibodies in the blood have appeared.

I think we are justified in saying that the influenza bacillus is not the cause of the present epidemic for these reasons: 1. The bacillus is not the cause because it is found in any disease. It is found in diseases like rheumatism, pertussis or

measles. 2. Animal inoculation has never produced it. 3. The influenza bacillus is a diplococcus. It causes leukocytosis, and the primary blood picture in influenza is leukopenia. 4. Influenza is a disease prone to secondary invasion. Prophylactic influenza inoculations have failed to furnish any protection against the disease. 5. There are as good reasons for saying that the influenza bacillus is the cause of pertussis or measles as for saying that it is the cause of influenza. 6. There are as good reasons for saying that the diplostreptococcus is the cause of influenza as for saying that Pfeiffer's bacillus is the cause.

As to other associated organisms in this disease, the diplostreptococcus and other streptococci are found. They are not so numerous in the sputum in the early days of the disease as in a normal throat. Under ten days my figures were 31 per cent, positive, and after ten days, 65 per cent. The so-called diplostreptococcus is perhaps the most direct cause of influenza pneumonia, and in the epidemic of 1889-1890 these were found repeatedly and were considered a cause by Ribbet and others. Mathers in this country very early discovered this organism and considered it as a cause. Nuzum and others have also found it. The general agreement seems to be that all the above-mentioned organisms are secondary invaders, and I think we are justified in this belief.

Experiments with a filtrable virus are not conclusive. Many more are necessary. It is difficult to explain the negative results with such material as unfiltered blood. They are not in harmony with our ideals of the disease.

The Pathologic Anatomy of Influenzal Bronchopneumonia

DR. E. R. LECOUNT: Published in THE JOURNAL, this issue page 650.

Clinical Aspects of Influenza

DR. SOLOMON STROUSE: From a clinical point of view it makes no difference by what name a disease is called. To most clinicians this is essentially a new disease, and in order to explain it we have to be in a state of mind free from bias. I hesitate to paint the picture of a disease which in December was so different from that in September and October. It is necessary to paint it from each phase. The disease was most severe in late September and October. It gradually waned during November, and in December another wave appeared that was quite different from the first wave. In January we can see patches of color from both of the preceding waves.

The incubation period is twenty-four hours. The onset occurs with acute fever without a definite chill; there is cough, and there are symptoms of pharyngitis. The greatest extent is from two to twelve days or longer, depending almost entirely on the extent of the primary pulmonary involvement. Complications are few—empyema, lung abscess and otitis media. The sequelae are multiple. The febrile prostration is the most constant after-effect.

The December wave showed a slight involvement of the nasal membrane. In October the throat showed merely an irritation of the anterior pillar. Recently, in January, an intense redness was found in the throat. It will take many thousands of carefully examined cases to ascertain the percentage of lung involvements. That pneumonia, generally lobular, but sometimes lobar, is the most serious accompaniment of the disease is recognized by all clinicians. I myself do not consider pneumonia a complication. It seems to be one form of the infection. There was no common course. Today we might find small patches of râles. This might disappear, to be replaced by another, or it might turn into a frank lobar pneumonia or lung abscess. An acute hemorrhagic pneumonia with only a few râles was not unusual.

The general appearance of the patient and the degree of mental disturbance gave the only points of value in determining the severity. In the beginning, the disease was much more violent. The patient would be ill only twelve or twenty-four hours. All these patients died.

Cardiac dilatation, which has always been described as occurring in regular pneumonia, appeared in this disease rarely except at the end of a toxemia. Cyanosis was marked. In some instances the lips looked as though they were painted with blue paint. Some of the patients looked as though they were suffering from acidosis, though that was not found. In some instances, acute hemorrhagic edema appeared like the ghost of peace when everything seemed to be going nicely. It looked as if the only cause of death could be in the brain. As Dr. LeCount mentioned, everything known and unknown in pathology was found.

The changes in the patient from day to day made it very confusing. We learned early in the epidemic that fever after the third or fourth day usually meant pulmonary involvement, and yet in some cases repeated examination failed to reveal any signs. Sometimes it was due to hyperthyroidism of pulmonary tuberculosis.

In Chicago, otitis media occurred as a complication, but nothing like in the proportion of 1890. Perhaps the only good thing about the disease was the repair in the lung. In many of the severe cases with lung changes in which the patient finally became well, the lungs showed almost complete repair fuctionally.

Complicated by other disease, influenza seemed to be no more severe than uncomplicated. Every one knows that the combination of pregnancy and influenza caused the highest death rate, perhaps 60 per cent. Later the general fall in the mortality included this group.

From October 1 to January 31, we treated 655 cases of influenzal pneumonia at the hospital. The average death rate in the 655 cases was 6.1 per cent. Our nurses' and physicians' mortality shows most strikingly in the statistics the comparative contagiousness of the disease. The physicians and nurses in the influenza ward who contracted the disease and the number who died were out of all proportion to the rest of the hospital personnel.

As to treatment, practically every form of drug was used. We spent days and nights trying to find out what to use, and at the present moment I do not hesitate to say that with the exception of salicylic acid, possibly an opium alkaloid or even a saline expectorant, and digitalis when necessary, the patient is better off if given no medicine. The patient should be put to bed early and kept there. This applies not only to the patient who has pneumonia, but also to the patient who is only mildly ill, who has just a slight discharge from his nose. He should be put to bed and kept there until one is sure what is going to happen, because this patient may develop a serious pneumonia.

The after-effects have been many. In some cases extreme physical fatigue was due to weaknened heart muscles, though endocarditis was not a common complication. Psychosis was extremely rare—I saw only two cases. Loss of hair and mild menstrual disturbances have been exceedingly common. Persistence of cough and pain in the chest for weeks after the disappearance of the disease have been so common without pulmonary findings that not much attention is paid to them. Hyperthyroidism is beginning to show up—perhaps only in patients who had the disease before.

Influenza from the Standpoint of Public Health

DR. HEMAN SPALDING: To combat influenza in a large city where there are big industries and a large number of persons employed is an entirely different problem from that presented in the small cities. To stop all great industries, street cars and factories would throw out of employment thousands of persons, who would suffer from want of the necessities of life. Such a course would cause more deaths from sickness and hunger than would be saved by shutting down these activities.

Persons ill of the disease should be isolated. Children in contact with sick families should be excluded from school for eight or ten days. When an epidemic comes on in the form of an avalanche, quarantining in the usual way is practically impossible. Under such conditions the best we can do is to isolate the infected person. A mask properly worn and changed several times a day no doubt helps to protect against influenza; but as it is worn by most people and would be worn, it is worse than useless. I believe that the vaccine used in Chicago helped to keep the people from becoming panicky.

Discussion on Influenza

DR. ROBERT B. PREBLE: It might be of interest to the members to hear something or other of the experiences which the

Army abroad had with the influenza epidemic. This epidemic began in the spring of 1918, was moderately severe, and then disappeared. Along about the middle of September we began to have cases of pneumonia, and we found the hemolytic streptococcus both in the sputum and at necropsy. In the course of a very short period we began to find influenza bacilli, and these increased without our being able to detect any difference in the clinical manifestations of the disease or in the pathologic findings. Then the influenza bacillus began to disappear, and the whole thing was over. We had far fewer cases than you had here, and the cases were obviously milder in type. For example, in a camp of 25,000 men we had only 500 cases of pneumonia, with a mortality which ranged as high as 33 per cent. As the streptococcus influenza went down and the pneumococcus became more common, the mortality fell to 10 per cent.

Another curious observation we made was that influenza developing among surgical patients was unaccompanied by mortality. None developed pneumonia. This was curious because most of these patients had septic wounds, and we had a great many septic compound fractures; yet none of these patients developed pneumonia, and we had no mortality.

DR. JULIUS H. HESS: I want to report a very interesting little group of cases that we had at Fort Benjamin Harrison. In a measles and streptococci pneumonia epidemic previously many of us had the idea there that there was some association between the high mortality and the typhoid vaccination. In the second week of the epidemic at Benjamin Harrison thirteen fresh recruits from North Dakota came into camp. They had not had triple typhoid vaccination. In that number the mortality was exactly the same as in all the other cases at camp that had had the typhoid vaccination.

In the symptomatology there was one point that stood out so prominently that I think it ought to be included as a prominent early symptom: the gangrenous odor on the breath of these patients. When one went into a ward that was not ventilated properly, the odor was just the same as one gets on coming into contact with an abscess of the lung. This odor was found in the first forty-eight hours, so it could not be associated with later complications.

We found that more than 70 per cent. of our throat smears and sputums showed a large number of Vincent's organism, a fusiform bacillus and spirilla. Whether this was a coincidence or not we do not know. In one instance we got a pure culture of fusiform bacilli.

DR. PETER BASSOE: If we were to read up the history of epidemics, we would find that in every epidemic of influenza there have been a large number of nervous complications. As far back as 1740 it was noted in an epidemic that there were many cases of nervous disease characterized by somnolence. In 1889 and 1890 there was an epidemic going over Europe without a marked mortality, but with a complication that was thought to be an encephalitis affecting the brain stem. This was known at that time as "nona," a name that has since been forgotten. In 1918 in England, in Austria and in France, there was described a condition called lethargic encephalitis, characterized by fever, headache, drowsiness, and more or less paralysis of the cranial nerves, particularly the ocular nerves. After a time it was thought to be a form of poliomyelitis, but it had none of the ordinary poliomyelitic symptoms. Finally, it was pointed out by a French surgeon that it was probably an influenza infection. The mortality was given as, I think, 25 per cent. in England and 35 per cent. in France. Now in the last few weeks there have been a number of such cases in Chicago. I myself saw six. Dr. Tieken saw six or seven. These cases have all been very much alike, characterized by very marked drowsiness, no cell increase in the spinal fluid, no headaches, and more or less cranial paralysis. I have seen some of the patients brought in with a facial paralysis and some with an ocular paralysis. I have a couple of cases under observation now. They show a very marked rigidity which is very similar to the rigidity we see in paralysis agitans. I think it is wise for us to be on the lookout when patients who have had influenza become very drowsy and then develop cranial nerve paralysis.

E. O. JORDAN: I should like to say just a word about some observations on the bacteriology of these findings, as it has a bearing on what has been said in regard to the different types in different sections. In our group, Section B, where there were ninety-two cases, we very rarely found Pfeiffer's bacillus in any of the smears throughout this epidemic. They could be found in a few cases by searching very carefully. At the same time, in October, in the cases obtained from the hospital, Pfeiffer's bacillus was found in considerable numbers. In this case it would seem to be a group affair. As to death rates, Philadelphia and Baltimore seemed to have much higher death rate than other large cities. New York and Boston had lower rates. Some cities in this neighborhood, Milwaukee, St. Paul and Minneapolis, had lower death rates than Chicago.

Current Medical Literature

AMERICAN

Titles marked with an asterisk (*) are abstracted below.

American Journal of Diseases of Children, Chicago

February, 1919, **17**, No. 2.

Comparison of Carbon Dioxid Tension of Alveolar Air and Hydrogen-Ion Concentration of Urine with Bicarbonate of Blood Plasma. O. M. Schloss, New York, and H. Harrington, Baltimore.—p. 85.
*Fetal Bronchiectasis. H. L. Koeckert, Cleveland.—p. 95.
*Intestinal Contents of Newly Born Infants. A. Hymanson and M. Kahn, New York.—p. 112.
Sleep in Children and Its Disturbances. A. Strauch, Chicago.—p. 118.

Fetal Bronchiectasis.—Koeckert reviews the literature on this subject and reports one case, in many respects similar to the other cases of fetal bronchiectasis of the Sacklunge type, in which an analysis of the cyst fluid was made. It closely approximated liquor amnii.

Intestinal Contents of New-Born.—The meconium of five infants, voided during the first twenty-four hours of extra-uterine life, was analyzed by Hymanson and Kahn. The iron and calcium contents were similar to those obtained in hunger feces. The phosphorus of meconium was less. The sulphur was much increased. Traces of ammonia were found in the meconium. No uric acid was found. This fails to corroborate Weintraud's analyses. Amylase was present in extremely faint traces. Neither trypsin nor erepsin were found. No lactase nor lipase was found.

Archives of Ophthalmology, New York

January, 1919, **48**, No. 1.

Basic Principles of Diagnosis in Motor Anomalies of Eye. A. Duane, New York.—p. 1.
Primary Intradural Tumor of Orbital Portion of Optic Nerve. M. Cohen, New York.—p. 19.
Experimental Studies in Intraocular Pressure and Tonometry. W. McLean, New York.—p. 23.
Two Rarely Described Instances of Scintillating Scotomata. J. A. Spalding, Portland, Me.—p. 38.
Surgery of Meibomian Cysts. J. Dunn, Richmond, Va.—p. 43.
Astigmatism Against Rule. J. Green, Jr., and W. F. Hardy, St. Louis. —p. 45.
Case of Acute Retrobulbar Neuritis in Child with Intestinal Stasis (Congenital Dilatation of Colon). M. J. Schoenberg, New York. —p. 56.
Extraction of Mature and Immature Cataractous Lenses Within Capsule. J. A. Kearney, New York.—p. 62.
Simple Electrical Device for Illuminating Field of Operation in Operations on Eye, Nose and Throat. J. A. Andrews, Santa Barbara, Cal.—p. 65.
Variation in Distribution of Nervous Abducens in Man. T. B. Magath, Chicago.—p. 67.
Eyesight of Negroes of Africa. J. N. Roy, Montreal, Canada.—p. 72.

Boston Medical and Surgical Journal

Feb. 13, 1919, No. 7.

Alveolitis Dentalis. Interstitial Gingivitis, So-Called Pyorrhea Alveolaris, Localized Catarrhal Stomatitis; Cause and Treatment. J. J. McNulty, New York.—p. 177.
Types of Tubo-Ovarian Suppuration. Cases. R. M. Green, Boston. —p. 179.
*Modification of Bradford Fracture Frame. A. S. Hyman, Boston. —p. 183.

Modification of Bradford Fracture Frame.—Hyman's modification of the Bradford frame consists of an upright frame attached to the bottom of the Bradford. To this upright is

connected a sliding bar which supports an adjustable pulley carriage. The sliding bar is fastened to the top and bottom of the upright with an adjustable brace. With the extension apparatus thus applied directly to the Bradford frame, it becomes possible to move the patient in bed from place to place without the slightest possible change in the position of the fragments of the fractured bone. It does away with the "hood" that is used to protect the feet of the patient from the weight of the bed clothes—the upright itself acts as a hood on which the sheets can be fastened. The apparatus can be used in the treatment of septic conditions of the leg or foot which require elevation and traction. Counter extension is easily obtained by placing suitable blocks under the bottom of the frame. Hyman believes that this apparatus will supplant Buck's extension apparatus.

Bulletin of Johns Hopkins Hospital, Baltimore

January, 1919, **30**, No. 335.

*Epidemic Influenza. A. Bloomfield and G. A. Harrop, Jr., Baltimore.—p. 1.
*Behavior of Blood Toward Oxygen in Influenzal Infections. G. A. Harrop, Jr., Baltimore.—p. 10.
*Bacteriologic Findings in Epidemic Influenza. S. E. Howard, Baltimore.—p. 13.
*Ectopic Pregnancy. H. M. N. Wynne, Baltimore.—p. 15.

Symptomatology of Epidemic Influenza.—Most of the patients on whom Bloomfield and Harrop report were seen from the very onset of symptoms and went through their illness without complications, thus affording an unusual opportunity to study the clinical features of the entire course of the disease. The mortality among these 268 cases was 4.8 per cent.; forty-one developed pneumonia, with a death rate of 32 per cent. The disease was ushered in by two groups of symptoms; in the first place the constitutional reactions of an acute febrile disease—headache, general aching, chills, fever, malaise, prostration, anorexia, nausea or vomiting; and in the second place, symptoms referable to an intense congestion of the mucous membranes of the nose, pharynx, larynx, trachea, the upper respiratory tract in general, and of the conjunctivae. Three distinct types of invasion were noted—abrupt invasion, gradual invasion and invasion with intermittent symptoms. Of particular interest were certain symptoms that were present within the two weeks preceding the onset, but which apparently were independent of the actual disease. In general, these "preonset" symptoms were in the nature of mild upper respiratory tract disturbances of from one to two weeks' duration, usually improving or well at the time of definite onset of the influenza.

The general appearance of the patients was most striking. In well marked cases, there was an intense, dusky, reddish-plum-colored erythema of the face, lips and upper chest, which usually faded off abruptly at the level of the breast, but in some cases extended over the entire chest and back, and occasionally involved the arms and legs. Early in the course of the epidemic the authors noticed an unusual bright red appearance of the throat in most of the patients, and more careful study of subsequent cases showed this to have striking and constant features. The changes in the mouth usually became full-blown during the first twenty-four hours of the disease. The most striking feature is a bright vermilion or scarlet injection of the pharynx, tonsils, pillars and soft palate. In many cases, this erythema extends over the entire mouth, and can be demonstrated by pressure on the mucosa of the cheek with a spatula. In the most marked cases, the entire mouth cavity has a flaming appearance. The tongue is usually coated, but if clean is bright red like the buccal mucosa. In from one half to two thirds of the cases at onset, one to three or four, or even more, dark crimson spots were seen on the mucosa of the inside of the cheek. The individual spots fade rapidly, disappearing without trace in from one to two days. They may reappear in repeated crops in the same individual, and are seen in convalescence in most of the cases. Another striking feature in the appearance of the mouth was a swelling of the minute nodules normally present on the soft palate. Once fully established, the disease picture was remarkably constant.

In the severer cases, a febrile albuminuria was present, usually clearing up promptly after free intake of water. The blood pressure was either normal or low. Low readings were especially frequent in the very asthenic cases. Leukopenia was the rule during the active stage of the disease. Apart from pneumonias, complications were few. The authors are convinced that epidemic influenza in 1918 is clinically identical with the disease as seen in previous pandemics, and that it is primarily a local disease of the respiratory tract. It presents a definite and characteristic clinical picture quite apart from pulmonary complications. The main features of the uncomplicated disease are a constant set of symptoms, characteristic erythema and appearance of the mouth, fever of determinate duration, and leukopenia. Proof is lacking that Pfeiffer's bacillus is the primary cause of uncomplicated influenza.

Behavior of Blood Toward Oxygen in Influenzal Infections.—The determinations included in Harrop's report were made in nine cases of postinfluenzal bronchopneumonia, three of them fatal, and in four uncomplicated cases of influenza, in the early hyperacute stage, when the characteristic dusky erythema or "cyanosis," was most striking. The oxygen content of the venous blood was determined by Lundsgaard's method. Both oxygen content and oxygen unsaturation showed normal values in uncomplicated influenza cases. In none of the cases of bronchopneumonia which recovered, and not until the terminal collapse in the fatal cases, has the venous oxygen content or the amount of oxygen unsaturation been abnormal. The values seems independent of temperature, pulse, respiration and extent of lung involvement. In two fatal cases with septicemia, after terminal collapse, there was a progressive fall in both the oxygen-combining power and the oxygen content of the venous blood, in general parallel. There was no increase at any stage of the disease in the values for the oxygen unsaturation of the blood.

Bacteriologic Findings in Epidemic Influenza.—The cultures reported on by Howard were taken from the cases reported in the paper by Bloomfield and Harrop. Cultures were made from the nasopharynx, the sputum and the blood. Among the organisms found were *B. influenzae*, green streptococci, pneumococci and staphylococci. The authors feel that none of the organisms isolated may be regarded as the cause of epidemic influenza. They are convinced that the *B. influenzae* of Pfeiffer is merely a secondary invader, though in some localities it may be a frequent cause of terminal bronchopneumonia. The other organisms isolated may also be regarded either as normal inhabitants of the mouth or as secondary invaders. The primary cause of epidemic influenza, therefore, is still unknown.

Ectopic Pregnancy.—Three hundred and three cases of ectopic pregnancy were analyzed by Wynne. This is an incidence of 1.3 per cent. of 22,688 gynecologic patients. Of 275 patients whose history as to previous pregnancy is recorded, fifty-seven had never before been pregnant. Forty-five patients had had operations prior to admission for ectopic pregnancy. The most common causes for which these patients sought medical attention were pain, complained of by 254; bleeding, complained of by ninety-three, and tumor, complained of by twenty-two patients. A history of abdominal pain was procured from 300 patients; the other three patients stated positively that there had been no abdominal pain nor discomfort, and they came to the clinic on account of irregular bleeding. In each of these three patients an unruptured tubal pregnancy was found at operation, but no evidence of any clot or free blood in the peritoneal cavity. Recurring attacks of pain occurred in 102 cases; seventeen patients complained especially of soreness and tenderness, rather than of definite pains. The character of the pain was described as violent, agonizing or severe in ninety cases, cramping in forty-one, colicky in four, bearing down in fourteen, laborlike in nine, shooting, cutting or sticking in 6, and as dull or aching in twenty-nine. One hundred and three patients stated definitely that they had missed one or more periods; and thirty-one said that their last period had been overdue for from one to five weeks, while fifty-two had noticed that the last period was abnormal in some other respect. The author emphasizes the fact that diagnosis of the cases is not so easy as many writers consider it.

The treatment of these cases (272) was operative, either by the abdominal or vaginal routes. In several cases posterior vaginal celiotomy was performed for diagnosis. Pelvic puncture was employed for pelvic hematocele in a number of cases, although in 60 per cent. of the cases a laparotomy was performed immediately afterward. In only fifty-five cases had rupture not occurred; 266 cases were tubal pregnancies; two were interstitial and 2 two were ovarian; 131 were on the left side, the remainder on the right. There were thirteen deaths in the series of 303 cases. Of 120 patients, 100 have been well since operation. Of 127 patients, there was no possibility of future pregnancy in thirty-three. Of the remaining ninety-six, in whom there was a possibility of future pregnancy, thirty-six have since become pregnant one or more times, and six patients had a second extra-uterine pregnancy.

California State Journal of Medicine, San Francisco

February, 1919, **17**, No. 2.

Post-Influenzal Empyema and Lung Abscess. C. W. Lippman, San Francisco.—p. 41.
Child Hygiene Bureau. A. Brown, San Francisco.—p. 42.
Pathology and Treatment of Influenzal Pneumonia. A. C. Reed, San Francisco, and H. Snure, Los Angeles.—p. 43.
Rattlesnakes, Their Venom and Antidotes. S. Pope, San Francisco. —p. 49.
Tuberculosis of Uterus. J. R. Scott, Los Angeles.—p. 52.
Diagnosis and Treatment of Glandular Obstruction at Neck of Bladder. L. C. Jacobs, San Francisco.—p. 56.
Recurrence of Stone in Kidney after Operation. W. P. Willard, San Francisco.—p. 58.

Illinois Medical Journal, Chicago

January, 1919, **35**, No. 1.

Health Insurance. C. J. Whalen, Chicago.—p. 1.
Compulsory Health Insurance. E. H. Ochsner, Chicago.—p. 3.
Compulsory Health Insurance. J. R. Ballinger, Chicago.—p. 9.
National Health Insurance. M. L. Harris, Chicago.—p. 10.
Compulsory Insurance. J. Fairhall, Danville, Ill.—p. 12.
Quackery Report of Committee Appointed by Douglas Park Branch of Chicago Medical Society. H. R. Krasnow, Chicago.—p. 16.

Journal of Cutaneous Diseases, Chicago

February, 1919, **37**, No. 2.

Tuberculosis of Skin. S. Pollitzer, New York.—p. 81.
Dermatoses Possibly Related to Tuberculosis. M. Scheer, New York, and J. E. Lane, New Haven, Conn.—p. 84.
Cases of Multiple Disseminated Lupus Vulgaris. H. Hazen, Washington.—p. 89.
Sarcoid of Boeck and Erythema Induratum of Bazin: Case. S. E. Sweitzer and H. E. Michelson, Minneapolis.—p. 98.
Military Tuberculosis of Skin, Lichen Scrofulosorum and Papulo-Tuberculosis. F. Wise, New York.—p. 105.

Journal of Infectious Diseases, Chicago

February, 1919, **24**, No. 2.

*Chemical Changes in Tuberculosis Tissues. G. T. Caldwell, Chicago. —p. 81.
*Study of Gram-Negative Bacilli of Renal Infections. R. H. Herrold and H. Culver, Chicago.—p. 114.
*Study of Complements Used in Wassermann Reaction. E. H. Ruediger, Bismarck, N. D.—p. 121.
*Pleomorphic Streptococci; Biologic Reactions. N. P. Sherwood and C. M. Downs, Lawrence, Kan.—p. 133.
*Variation in Diphtheria Group. F. D. Meader, Providence, R. I.— p. 145.
Bacteriologic Study of Sardines. M. M. Obst, Washington.—p. 158.
*Effect of Concentrated Solutions of Certain Magnesium Salts on Pyogenic and other Bacteria. Z. Northrup, East Lansing, Mich.— p. 170.
*Demonstration of Immune Opsonins for the Pleomorphic Streptococcus in Experimental Poliomyelitis in Monkeys. W. M. Davis, Rochester, Minn.—p. 176.
*Bacteria in Sputum in Measles. R. Tunnicliff, Chicago.—p. 181.

Chemical Changes in Tuberculous Tissues.—For the sake of comparative results, Caldwell made analyses of normal as well as tuberculous tissues. Lymph glands and liver tubercles were used exclusively for the tuberculous specimens, and normal glands and livers furnished the materials for comparison. Many of the findings of other workers in this field, notably Wells, are confirmed. For details, the original article should be consulted.

Gram-Negative Bacilli in Renal Infections.—A classification of eighty-six different strains of colon bacillus-like organisms by means of cultural, fermentative and serologic methods is made by Herrold and Culver. These organisms were all secured by ureteral catheter from the kidneys and isolated by cultivation on blood-agar plates.

Complements in Wassermann Reaction.—Ruediger found that the complements of fresh guinea-pig serum varied greatly in fixability. Human complement gave much weaker positive results than did guinea-pig complement. Guinea-pig complement left on the clot and kept in the refrigerator remained fairly constant for three days, while complements which had been removed from the clots deteriorated more rapidly. Ramy's method of preserving complement by sodium acetate was a total failure in Ruediger's hands. Glycerol seemed to prevent deterioration of complement for a few days.

Pleomorphic Streptococci.—Pleomorphic streptococci which, according to Holman, would be classed as *S. salivarius* were found by Sherwood and Downs in the nasopharynx of approximately 25 per cent. of apparently normal persons. These organisms, as a rule, showed some pathogenicity for young rabbits, which develop agglutinins for the strains of organisms injected. Injected intracerebrally, the cocci remained localized in the nervous system throughout which they became disseminated. When injected intravenously they were found in the nervous system within three or four hours. After seventy-two hours they were present usually only in the nervous system. The common symptoms were rise in temperature and loss of muscle tone, with occasional flaccid paralysis and permanent impairment of the legs. The changes in the nervous system were hyperemia, frequently hemorrhage, increase in round and neuroglia cells and perivascular infiltration of round cells. The serum of normal persons frequently contains agglutinins for these organisms, occasionally in dilutions of 1:100.

Variation in Diphtheria Group.—Twenty-five cultures of members of the diphtheria group isolated from various sources were studied by Meader, and he found that variations in morphology, in fermentative reactions and in virulence occur in subcultures derived from one parent strain. The virulence of a strain is not closely correlated with its morphology, nor is it correlated with its fermentative reactions.

Effect of Magnesium Salts on Certain Bacteria.—The fact that Epsom salt has a salutary effect on the skin led Northrup to investigate the influence of magnesium sulphate on the organism commonly found in ordinary pimples, *Staphylococcus aureus*. It was negative. Streptococcus skin infections may, however, be inhibited if any concentration of magnesium sulphate is used externally. Magnesium chlorid had the most marked inhibitory action on the growth of all organisms used in the experiment.

Opsonins in Experimental Poliomyelitis.—A well marked increase in opsonin for the pleomorphic streptococcus in the serum of monkeys during attacks of poliomyelitis following the inoculation of virus was noted by Davis. Since this increase in opsonin occurs toward strains derived from human cases as well as from experimental poliomyelitis following the injection of virus, Davis says that the pleomorphic streptococcus in this disease cannot be regarded as an accidental invader of the nervous system.

Bacteria in Sputum in Measles.—Seventeen specimens of measles sputum were examined by Tunnicliff on the first or second day after the appearance of the eruption. Direct smears of the washed sputum showed the presence of a variable number of small (0.5 microns) round or very slightly elongated gram-positive diplococci, often in large numbers and frequently the only organisms present. The diplococcus was isolated from all of the sputum examined. *B. influenzae* and *S. hemolyticus* were each isolated twice.

Journal of Pharmacology and Experimental Therapeutics, Baltimore

December, 1918, **12**, No. 5.

*Pharmacology of Ureter; Action of Some Optic Isomers. D. Macht, Baltimore.—p. 254.
*Dichlorethylsulphid (Mustard Gas); 1. Systemic Effects an Mechanism of Action. E. K. Marshall, Jr., V. Lynch and F. W. Smith, Washington.—p. 265.

*Id. 2. Variations in Susceptibility of Skin to Dichlorethylsulphid. E. K. Marshall, Jr., V. Lynch and H. W. Smith, Washington.—p. 291.

Pharmacology of Ureter.—The action of optic isomers on the isolated ureter were studied by Macht. He found that in case of the different optic varieties of hyoscyamin, scopolamin, epinephrin and camphor, the pharmacologic action was different, and that the levogyrous variety in each case was the more stimulating than the dextrogyrous one.

Systemic Effects of Dichlorethylsulphid.—Dogs and fish were used by Lynch and his associates in this study. It was found that dichlorethylsulphid is absorbed through the lungs and produces definite, characteristic, systemic effects. The symptoms of injection of the substance are salivation, vomiting and diarrhea, tonic and clonic convulsions, slow and irregular heart, followed by a rapid pulse, and stimulation of the respiration. A dose of 6 mg. or less per kilogram, injected intravenously in aqueous solution, proves fatal for dogs. Dichlorethylsulphid appears to be excreted in the urine, in part, at least, as dihydroxyethylsulphid, which has been shown to be a comparatively nontoxic body. The lesions in the intestine suggest that excretion of the substance may also take place here. The authors advance as a theory of action that the dichlorethylsulphid penetrates the cells, and in the aqueous phase of the cell, hydrolyzes to hydrochloric acid which is responsible for the damage. Sodium bicarbonate in large doses somewhat alleviates the symptoms, but does not prevent death. Fish are much less susceptible to this substance when kept at a low temperature after exposure rather than at room temperature. The hydrolysis of the substance is much slower at a low temperature. Monochlorethylsulphid, and dichlorpropylsulphid are lipoid soluble and easily hydrolyzed. They both act similarly to mustard gas. The authors believe that dimethylsulphate acts by intracellar liberation of sulphuric acid.

Action on Skin of Dichlorethylsulphid.—Two methods were used by the authors for determining the cutaneous sensitivity of individuals to dichlorethylsulphid. The first consisted in exposing the skin to the vapors of the substance under constant conditions and determining the minimum time of exposure which is necessary to produce a visible reaction within twenty-four hours. The second method consisted in applying to the skin standard solutions of mustard gas in paraffin oil. The first method gave the most accurate results, although the second is very much simpler and more rapid in its application. Tremendous differences in sensitivity were found on the part of different individuals. A large group of white men tested showed about 2 to 3 per cent. of hypersensitive men and 20 to 40 per cent. of resistant men. Negroes, as a race, are much more resistant than white men. Sweating and moisture increase the sensitivity of the skin. Men may become more sensitive from continued exposure to the gas, and especially when severely burned. An atypical reaction is described in a man who became more sensitive from continued working with the substance; this appears to be of anaphylactic nature. The skins of ordinary laboratory animals were also tested. The monkey and guinea-pig were the most resistant, while the horse was the most sensitive. No animal exhibited a reaction at all similar to that in man. No animal has yet been found which will give a blister from the application of mustard gas.

The only factor in the general characteristics of the skin which would appear to have a distinct bearing on the question of sensitivity is the apparent thickness of the skin. Fifteen minutes after pure dichlorethylsulphid is applied to the skin it can be removed almost entirely by long continued rubbing with kerosene. This indicates that the substance is not immediately absorbed into the deeper layers of the skin. A resistant individual whose normal minimum burning time is four to five minutes and who does not react to the 1 per cent. oil solution, can be made to give a reaction to a fifteen to thirty second exposure of a 0.01 per cent. oil solution by covering the area of application with a glass cup immediately after, and leaving it covered for six to eight hours. It was found that when two vapor tests were made under identical conditions on the arm of a sensitive individual (five minutes exposure), and immediately after the exposure the arms of two individuals were impressed on each of the exposed areas for five minutes the burns were modified in intensity. If the recipients are respectively more and less resistant than the donor, that burn on the donor's arm given to the more resistant man will be the mildest. If a sensitive individual impresses his arm alternately against burns of the same concentration and exposure on a resistant and sensitive man, the recipient receives a more severe burn from the sensitive than from the resistant man.

This would indicate that the skin of a resistant individual displays a greater affinity or capacity for dichlorethylsulphid than that of a sensitive man. A tentative explanation of this phenomenon is offered. A three phase system is involved—the air over the skin surface constitutes the outer phase; some fatty or keratinous elements of the skin, the central phase; and a cellular portion of the skin the inner phase. The central phase is rich in lipoids and poor in water, while the inner phase is rich in water and poor in lipoids. After exposure to the vapors of dichlorethylsulphid the central phase is the absorbing agent and tends to establish equilibrium with the other two phases. On account of the lipoid nature of the central phase no damage is produced here because the compound is not hydrolyzed. On its passage from the central to the inner phase hydrolysis takes place within the cell and damage results when a sufficient concentration of hydrochlorid acid is attained. The outer phase is constantly being freed from vapor by diffusion and convection currents, so more and more can evaporate from the central phase. The susceptibility of an individual depends on the relative power of the central phase to hold the poison in an inactive form (not hydrolyzed) and prevent its entry into the inner phase at a sufficient velocity to result in the formation of a toxic concentration.

Kentucky Medical Journal, Bowling Green

February, 1919, **17**, No. 2.

*Focal Infection from Dental Standpoint. R. Grant, Louisville, Ky.—p. 57.
Smallpox in Country Districts. G. B. O'Roark, Grayson, Ky.—p. 60.
The Methods of Vaccination. R. B. Norment, Louisville.—p. 61.
Incoming Draft. V. E. Miltenberger, Camp Taylor, Ky.—p. 64.
Communicable Diseases at Camp Zachary Taylor. W. W. Hamburger, Chicago.—p. 67.
Neuro-Psychiatry. M. Board, Louisville.—p. 69.
Influenza Epidemic. W. F. Boggess, Louisville.—p. 72.
Volunteer Medical Service Corps. E. P. Davis, Philadelphia.—p. 79.
Medical Man and War. J. D. Liles, Vanceburg.—p. 85.
Pellagra, Older and Newer Ideas as to Cause and Cure. C. B. Van Arsdall, Harrodsburg, Ky.—p. 87.
Broncho-Pneumonia. U. V. Williams, Frankfort, Ky.—p. 91.

Focal Infection.—Abstracted in THE JOURNAL, Oct. 5, 1918, p. 1165.

Medical Record, New York

Feb. 15, **95**, No. 7.

Syphilis and Parasyphilis of the Central Nervous System. M. Neustraedter, New York.—p. 265.
*Major H. R. Allen's Instantaneous Method of Reshaping Tool Handles So That They May Be Used by Deformed or Crippled Hands. R. W. Shufeldt, Washington.—p. 269.
*Control of Hemorrhage from Large Sinuses of Brain by Invulsion of Outer Wall into Lumen. W. P. Eagleton, Newark, N. J.—p. 274.
*False Teeth as Cause of Cancer. C. E. Field, New York.—p. 275.
Sleep as Mentioned by Rabelais. D. W. Montgomery.—p. 277.
Distressing General Conditions Traceable to Eye Conditions. J. A. Kearney, New York.

Reshaping Tool Handles for Use by Deformed Hands.—Using the composition prepared by Major Allen, and carrying out his idea in another direction, Shufeldt makes a rough model of a hand with ordinary gelatin and dental modeling compound, and when it is in plastic condition it may be made to hold any tool or instrument that the cripple (mutilé) desires to use at the time. This mold or composition hand may be detached and another screwed on in a moment, to meet what the man desires to perform. Then, too, it is an easy matter, and one that requires but a few minutes, to plunge this "hand" into hot water, remove the fork, insert a lead pencil or a pen, or anything else, for the matter of that, which the cripple desires to use next, dip the composition in ice water, and in a very brief space of time the member is ready for use as desired. An ingenious person

may work in all sorts of useful designs—as a single finger that may be used on a typewriter—and for a great many other purposes. In other words, an artificial arm, with a detachable hand may, by this plastic hand attached, be made to be ten times more serviceable than the artificial hands as they are now usually manufactured.

Control of Hemorrhage from Large Sinuses of Brain.—Eagleton describes a special apparatus, combining an obturator and ligating principle, which he uses in these cases. He reports a successful operation for cerebellar abscess by obliteration of the lateral sinus and exploration and drainage through its inner wall and anterior surface of cerebellum.

False Teeth as Cause of Cancer.—The basis of Field's report is an analysis of a series of 87 clinical cases coming under his observation in which the initial ulceration or nodule was in close proximity to an artificial denture of which the patient offered complaint. Nineteen showed original development of the tumor adjacent to bridge work and 68 near plate work of various types. The malignancy presented in 59 cases in the superior maxilla as against 28 affecting the inferior maxillary region. The tumors were classified as follows: carcinoma, 65; sarcoma, 9; osteoma, 3; fibroma, 4; chondroma, 4, and melanosarcoma, 2.

Michigan State Medical Society Journal, Grand Rapids

February, 1919, **18,** No. 2.

*Influenza and Influenza Pneumonia. D. M. Cowie and P. W. Beaven, Ann Arbor.—p. 41.
Influenza and Pneumonia with Their Complications. L. S. Beals, Camp Custer.—p. 47.
Thrombosis of Coronary Arteries. J. B. Herrick, Chicago.—p. 49.
A Plea for the Infant. G. McDonald, Detroit.—p. 51.
Some Economic Problems in Feeding Infants and Children. B. R. Hoobler, Detroit.—p. 52.
Case of Acute Mastoiditis, Sinus Thrombosis and Bacteriemia with Recovery. J. S. Wendel, Detroit.—p. 54.
Case of Congenital Ptosis of Eyelids. H. L. Begle, Detroit.—p. 55.
Gangrene of Foot Following Influenza. J. H. Andries, Detroit.—p. 56.
Case of Pernicious Anemia. W. J. Wilson, Jr., Detroit.—p. 57.
Case of Cerebro-Spinal Syphilis. F. R. Starkey, Detroit.—p. 58.

Influenza and Pneumonia.—One hundred and thirty-one cases were carefully analyzed by Cowie and Bevan. It was noted that the respiratory rate is no guide to the seriousness of influenza pneumonia. The myocardium seems to be unaffected throughout the course of the influenza and the pneumonia. This observation was borne out by the necropsies made. A low leukocyte count is characteristic of influenza and influenza pneumonia. A leukopenia frequently occurs, but it is not the rule. Albumin and casts were not found in the straight influenza cases. They were present in 70 per cent. of the pneumonia cases. The authors regard their presence as indicative of pneumonia and of grave significance. Cyanosis was a nearly and almost constant sign of the pneumonias. In every case observed, pneumonia was demonstrated. In 67 per cent. of the influenza pneumonias the process started in the left base posteriorly. Bloody sputum was not always a grave symptom of pneumonia. Cases with pulmonary hemorrhages ended fatally. The authors believe that all deaths from influenza are due to bronchopneumonia.

Military Surgeon, Washington, D. C.

February, 1919, **44,** No. 2.

Preparation of Medical Officers of Combat Divisions in France at Theatre of Operations. B. K. Ashford, M. C., U. S. Army.—p. 111.
Epidemiology of Sputum Borne Diseases and Relation to Health of National Forces. E. B. Vedder, M. C., U. S. Army.—p. 123.
Sanitation in Camps and Hospitals on British Front in France (Concluded). F. L. Pleadwell, M. C., U. S. Navy.—p. 154.
Naval Transportation of Army Sick and Wounded Overseas. J. A. Murphy, M. C., U. S. Navy.—p. 178.
Medical Department of Cuban Army and Navy; Its Reorganization. V. Havard, Cuba.—p. 186.

Minnesota Medicine, St. Paul

February, 1919, **2,** No. 2.

Medical Service with British Expeditionary Forces in France. E. T. F. Richards, St. Paul.—p. 41.
Neuro-Circulatory Asthenia (Irritable Heart); Study of 35,000 Draft Recruits. E. L. Touhy, Duluth, Minn.—p. 47.
Prostatic Calculi. E. S. Judd and J. L. Crenshaw, Rochester, Minn. —p. 52.
Slight Symptoms in Gall-Bladder Disease with Marked Gross Pathologic Lesions. J. S. Holbrook, Mankato, Minn.—p. 57.
Surgical Importance of Abdominal Adhesions. W. R. Bagley, Duluth, Minn.—p. 58.
*Relation Between Tonsillar Infection and Recurrent Vomiting. R. Taylor, Winona, Minn.—p. 61.

Tonsillar Infection and Recurrent Vomiting.—Among forty-seven cases of recurrent vomiting, Taylor found that in forty there was evidence of tonsillar or adenoid disease. In six of the twenty-four patients whose tonsils and adenoids were removed, no further information could be secured. One of the remaining patients is unimproved. Five are very much improved, and twelve have had no attacks since operation, this period varying from seven months to six years.

Modern Hospital, Chicago

February, 1919, **12,** No. 2.

Hospital Construction at U. S. Naval Hospital, New York. G. A. Lung, U. S. N.—p. 81.
Mending Before Condemnation and Replenishing of Supplies. L. S. Fish, Chicago.—p. 84.
Service Building of Rhode Island Hospital. W. C. Hill, Boston.—p. 85.
Educational Value of Hospital Reports. C. E. McCombs, New York. —p. 90.
Telephone Operator's Information Card. P. O. Clark, Wheeling, W. Va.—p. 94.
Venereal Disease Control. C. C. Pierce, U. S. P. H. S.—p. 95.
Standards for Tuberculosis Sanatoriums. R. Bosworth, St. Paul.—p. 97.
Problem of Hospital Intern. H. W. Hersey, Boston.—p. 107.
Hospital Accounting. C. A. Porter and H. K. Carter, Chicago.—p. 111.
Little Journeys to Places and People Worth Knowing. M. J. Robinson, Chicago.—p. 114.
State Tuberculosis Sanatoriums in Illinois. G. T. Palmer, Springfield, Ill.—p. 128.
Public Health and Venereal Disease. A. Thompson, Washington, D. C.—p. 129.
Assistance of Publicity to Hospitals. R. S. Somerville, Vancouver, B. C.—p. 136.
A Square Deal for Pupil Nurse. C. E. Gray, Blackwell's Island, N. Y.—p. 141.
Keeping Up the Fight. C. C. Pierce, U. S. P. H. S.—p. 143.
Conservation in Planning of Diets. E. V. McCollum, Baltimore.—p. 147.

New Jersey Medical Society Journal, Orange

February, 1919, **16,** No. 2.

Laboratory Findings; Their Proper Interpretation. O. Lowy, Newark, N. J.—p. 37. (To be continued.)
Mastoid Difficulties. D. M. Yazujian, Trenton, N. J.—p. 41.

New York Medical Journal

Feb. 15, 1919, **109,** No. 7

*Etiology of Chorea. S. Graves and B. H. Paige, Louisville, Ky. —p. 265.
Medical and Surgical History of American Participation in European War. Loy McAfee, Washington, D. C.—p. 268.
Bacteriologic Examination of Sputum in Influenza. H. U. Williams, Buffalo.—p. 273.
Venereal Diseases in Army. I. W. Brewer, Camp Humphreys, Va. —p. 273.
Iron and Arsenic Intravenously in Treatment of Anemia in Chronic Ailments. A. C. Geyser, New York.—p. 274.
Tonic Spasms: Significance as Clinical Phenomenon. J. M. Taylor, Philadelphia.—p. 276.
Influenza and Epidemic Pneumonia. H. I. Goldstein, Camden, N. J. —p. 278.
Treatment of Lung Injuries. C. G. Cumston, Geneva, Switzerland. —p. 286.
Prophylaxis and Treatment of Influenza. L. T. de M. Sajous, Philadelphia (continued).—p. 288.

Etiology of Chorea.—The case cited by Graves and Paige is unusual because of its rather acute onset, apparently simultaneously with "rheumatism," its associated endocarditis and its postmortem pathology. The patient was ill only about three weeks. The final gross and microscopic diagnoses were: lobular pneumonia, vegetative endocarditis, acute toxic splenitis, toxic enteritis and appendicitis, toxic hepatitis and midzonal necrosis; toxic nephritis (early tubular), polypoid adenomata of cecum. The bacteriology showed pneumococcus from the lungs and heart's blood (septicemia five hours postmortem) and *Staphylococcus aureus* with pneumococcus from the right middle ear. This case offers several interesting features. Apparently a typical acute chorea made its appear-

ance synchronously with acute infection. The spinal fluid was negative. Histologically the brain was negative. The authors suggest that the blood and spinal fluid be examined repeatedly, bacteriologically and serologically, in every case of chorea. It is possible that acute or Sydenham's chorea is due to the action of bacterial toxins, perhaps a selective action on central nerve cells, in persons whose inherited nervous instability makes them more readily subject to such toxic action.

Bacteriologic Examination of Sputum in Influenza.—The sputum of 53 influenza patients was examined bacteriologically by Williams. He found the following: pneumococci (probable) in 33 cases; streptococci (probable) in 17 cases; staphylococci and tetrads, in 24 cases; gram-negative cocci in 42 cases; Pfeiffer bacilli in 16 cases; other bacilli in 30 cases; hemolysis present in 23 cases. The sputum always contained two organisms in considerable numbers, and frequently three or more. The sputum did not contain Pfeiffer's bacillus in overwhelming numbers.

Ohio State Medical Journal, Columbus

Feb. 1, 1919, **15**, No. 2.

Local Treatment of Acute Rhinitis. J. A. Thompson, Cincinnati.—p. 63.
Scarlet Fever: Diagnosis and Treatment. A. J. Bell, Cincinnati.—p. 64.
How Physicians of Ohio May Aid in Campaign Against Venereal Diseases. H. N. Cole, U. S. P. H. S.—p. 68.

Surgery, Gynecology and Obstetrics, Chicago

February, 1919, **28**, No. 2.

*Clinical Significance of Congenital Anomalies of Kidney and Ureter. H. G. Bugbee and J. R. Losee, New York.—p. 97.
*Tubal and Ovarian Hemorrhage. J. W. Bovée, Washington.—p. 117.
*Chorio-Epithelioma. End Results of Operative Treatment in Nine Cases. H. N. Vineberg, New York.—p. 123.
*Vaginal Hysterectomy Technic for Cure of Prolapse of Uterus When Removal of Uterus Is Necessitated. D. Bissell, New York.—p. 138.
*Effect of Hysterectomy on Ovarian Function. E. H. Richardson, Baltimore.—p. 146.
*Pathology of Goiter. B. T. Simpson, Buffalo, N. Y.—p. 153.
Hypertrophic Stenosis of Pylorus in Infants; Six Cases. T. M. Green and J. B. Sidbury, Wilmington, N. C.—p. 159.
*Etiology of Toxemia of Pregnancy With or Without Convulsions. J. E. Talbot, Worcester, Mass.—p. 165.
*Diagnosis and Treatment of Chronic Duodenal Obstruction. E. L. Kellogg, New York.—p. 174.
Infection of Fused Kidney with Duplication of Left Renal Pelvis. L. Buerger, New York.—p. 183.
*Extreme Pendulous Abdomen and Surgical Treatment by New Three-Flap Operation. N. J. MacLean, Winnipeg, Canada.—p. 190.

Congenital Anomalies of Kidney and Ureter.—The twenty-three clinical cases of anomalies of the kidney and ureter cited by Bugbee and Losee represent two single kidneys, both the seat of infection, one presenting a calculus obstruction of the single ureter; three fused kidneys; one horseshoe kidney, the seat of tuberculosis, and two fused kidneys apparently free from infection but causing pressure in their anomalous position. All six cases showing duplication of the renal pelvis had a pyelonephritis. The six cases presenting one or both kidneys in an anomalous position showed renal infection, one being tuberculosis, and another having a renal calculus. The six cases showing anomalies of one or both ureters all were the seat of real infection. It must be noted that but two of the cases presented renal infection which indicates that a single kidney called on to do double work, a malformed or malplaced kidney having poor drainage, poor blood supply and subject to pressure is prone to infection. Anomalies of the ureter also interfere with kidney drainage, thus predisposing to infection.

The necessity for assisting such kidneys to perform their function is apparent. The indications are to throw less work on the kidneys. With four exceptions the infections were all of the colon type. The necessity of attention to the intestinal tract is apparent. Lavage of the kidney pelvis has been beneficial, and permanent drainage with the ureteral catheter, often for several days, has proved efficacious. The surgical indications are to improve the drainage and relieve pressure, if necessary, by placing the kidneys in more nearly their normal position; to remove any obstruction to renal drainage (as a calculus) to remove a diseased kidney when destroyed beyond repair, if the opposite kidney is able to carry on the necessary function, or in rare cases to remove the kidney which cannot be replaced and is causing pressure symptoms due to its malposition. Whenever an abdominal mass is found, a renal anomaly must be excluded. If it is not possible to make a positive diagnosis of the extent of the lesion before operation, the operation should include an exploration of both kidneys.

Tubal and Ovarian Hemorrhage.—Abstracted in THE JOURNAL, June 22, 1918, p. 1975.

Operative Treatment of Chorio-Epithelioma.—The fact that he obtained eight recoveries in nine cases is attributed by Vineberg to the circumstance that the diagnosis was made at an early stage of the disease. The only fatality in the series occurred in the case of a patient who was subjected to two curettages, the pathological report of the first being misleading, although a tentative diagnosis, on the clinical evidence, had already been made by Vineberg. The author agrees with Pollosson and Violet, that the better results obtained in cases following hydatid mole are probably due to the circumstance that the cases are watched more closely, and the diagnosis, in consequence, is made at an earlier stage.

The treatment of chorio-epithelioma, once the diagnosis has been made, resolves itself into an immediate panhysterectomy, for there is no way of determining whether the individual case be a highly malignant one, or one that might undergo spontaneous cure. The latter contingency is so unusual that for all practical purposes it must be left out of consideration. When the growth is discovered while emptying the uterus of a hydatid molar pregnancy, the natural thing to do would be to complete the operation through the vaginal route. The same would apply when, in a doubtful case, an exploration of the inner and outer walls of the uterus would be made through a vaginal incision. In most all other instances, the abdominal route probably is to be preferred, for it embraces less traumatism and consequently less danger of causing metastases.

Vaginal Hysterectomy for Cure of Prolapse of Uterus.—Vaginal hysterectomy for the cure of prolapse of the uterus where the removal of the uterus is necessitated and fascial lapping is advocated by Bissell in all forms of vaginal prolapse. He describes his technic in detail.

Hysterectomy and Ovarian Function.—An abstract of this article was published in THE JOURNAL, June 15, 1918, p. 1885.

Pathology of Goiter.—Enlarged thyroids are classified by Simpson in five groups, namely: simple goiter, multiple adenomata, colloid goiter, exophthalmic goiter, malignant neoplasms. These are all characterized by the common factor of enlargement of the thyroid but otherwise differ markedly from one another. They may be differentiated clinically in nearly all cases by careful examination.

Etiology of Toxemia of Pregnancy.—The deduction made by Talbot is that the fundamental cause of toxemia of pregnancy with or without convulsions is not in the products of conception. In general the severity of the symptoms of toxemia is proportional to the amount of sepsis present. One of Talbot's cases was a marked exception to this statement. Talbot is convinced that to overcome the chronic sepsis which occurs in connection with the teeth, would surely eliminate the most potent cause of chronic nephritis.

Chronic Duodenal Obstruction.—Kellogg cites a case of duodenojejunostomy for duodenal ulcer which he believes is the first on record.

Three-Flap Operation for Extreme Pendulous Abdomen.—In this three-flap operation, which MacLean believes is the method of choice when the operative treatment is undertaken in the case of extreme pendulous abdomen, two long incisions, forming an ellipse, are made from one side of the abdomen to the other, the upper passing above the umbilicus, the lower passing about 2 inches above the fold where the abdomen hangs over the pubes. The skin and fat are dissected away from the external oblique aponeurosis until the ring of umbilicus is met. The abdomen is then opened at the umbilicus, and the mass dissected away from the umbilical ring. The part of the abdominal wall which has given way can be lifted up in the form of a cone with the umbilicus

forming the apex. If the fingers be inserted within this cone the internal ring of the protusion can be felt at its base. The upper limits of the ring, while several inches from the umbilicus in the pendulous abdomen cases, is a point very close to the normal anatomic position of the umbilicus, and corresponds to the lowest linea transversea of the recti muscles. Two lateral incisions are now made from the umbilical ring to the inner margins of the recti muscles. A third incision is made from the umbilical ring downward to the firm lower margin of the internal ring where the recti muscles decussate. Three flaps are thus formed, two lower and one upper. The two lower flaps are overlapped from side to side, thus reducing by one half the space between the recti muscles. The free margin of each flap is stitched with strong chromic catgut to the firm margin of the sheath of the opposite rectus muscle. The upper flap is drawn upward, and the upper margin of this lower and now double flap is stitched to the upper margin of the so-called internal ring. The upper flap is next drawn and spread over the lower double flap and its margin stitched to the aponeurosis of the external oblique. The skin is closed, and three small tube drains are inserted, one at each angle and one in the center of the wound. In the place of the relaxed wall is now a three-fold aponeurosis covering the opening and secured at every point to normal anatomic structures that have not yielded to the intra-abdominal pressure.

Texas State Journal of Medicine, Fort Worth

January, 1919, **14**, No. 9.

Results of Tonsillectomy During Acute Stage of Follicular Tonsillitis. R. H. Gough, Fort Worth, Tex.—p. 293.
*Evacuant Enema in Surgery. J. T. Moore, Houston, Tex.—p. 295.
Need for Improvement in Teaching Obstetrics. C. R. Hannah, Dallas, Tex.—p. 297.
Tonsillar Hemorrhage; Operative and Post-Operative. R. W. Moore, Fort Worth, Tex.—p. 300.

Evacuant Enema in Surgery.—The enema is regarded by Moore a more physiologic procedure for the preoperative preparation than the habit of giving a purge. He has operated on several patients without any other preparation, as far as the digestive tract is concerned. His routine procedure has been to have the patient eat as usual, giving a regular supper on the day previous to the operation. Following the supper, before bed time, an ordinary soap-suds enema of 1 quart is given. This empties the lower bowel. The patient is given plenty of water to drink during the night. Water should be offered the patient at intervals in the morning, whether asked for or not. At 6 or 7 o'clock in the morning another enema is given, usually with good, easy results. The patient has now one, two or three hours of rest before the operation is to be done, drinking water to within one hour of operation. Moore has noted that nausea is less frequent following anesthesia and operation where the enema has been used, as a result of the fluids being left in the tissues to be handled in the normal way.

FOREIGN

Titles marked with an asterisk (*) are abstracted below. Single case reports and trials of new drugs are usually omitted.

Brain, London

November, 1918, **41**, Parts 3 and 4.

*Occurrence of Unsuspected Involvement of Central Nervous System in Unselected Cases of Syphilis. P. Fildes, R. J. G. Parnell, and H. B. Maitland.—p. 255.
*Existence of Two Distinct Physiologic Systems for Transmission of Motor Impulses in Peripheral Nerves. J. R. Hunt.—p. 302.
Sensual Rôle of Proprioceptive Nerve-Supply of Extrinsic Ocular Muscles. C. S. Sherrington.—p. 332.
Some Principles of Neurology. H. Head.—p. 344.

Unsuspected Involvement of Central Nervous System in Syphilis.—Fildes and his associates examined 624 syphilitic men, of whom the great majority were in the early stages of the disease and showed no obvious signs of nervous disease. Of these, 18 per cent. showed undoubted signs of an abnormal condition of the central nervous system. Of all men who had been affected for more than six months and showed no symptoms, no less than 35 per cent. had abnormal central nervous systems. The onset of the abnormality may occur very early. In two cases it was demonstrable before the Wassermann reaction had become positive in the serum after infection. The nature of this abnormality in the central nervous system does not admit of doubt. It is a syphilitic meningitis. The authors base this opinion not only on the presence of lymphocytes in the cerebrospinal fluid but also on the frequent appearance of polymorphonuclear leukocytes in the more pronounced cases. Furthermore, in a large proportion of the abnormal cases, the fluid showed a positive Wassermann reaction, while in one case *S. pallida* was found by the method of dark-ground illumination. There is no evidence that previous arsenical treatment increases either the number or severity of the affected cases.

An outstanding feature of these cases is the almost total lack of symptoms. Very few of the men complained of disability even when the meningitis was acute enough to produce a visible opalescence in the cerebrospinal fluid. Very few of these men showed any clinical signs of nervous disease detectible by examination. On the other hand, a considerable proportion of the abnormal cases had lesions of the eye grounds, which were of slight extent, but which, nevertheless, indicated a commencing retinitis. A certain number of patients showed affections of the internal ears, but there was no evidence that these were commoner than among non-syphilitics or syphilitics with apparently intact nervous systems. Antisyphilitic treatment has a marked ameliorating action on these conditions. Some are rapidly reduced to normal, while the great majority were shown to be improved within the period of observation. On the other hand, a few cases showed a remarkable resistance to treatment; the meningitis actually progressed in spite of repeatedly renewed treatment. Although the demonstration of a negative Wassermann reaction in the serum denotes that an affection of the central nervous system is improbable, the authors do not believe that it is excluded, and in view of the importance of early treatment (and the value of the operation in prognosis) it is probable that lumbar punctures should never be omitted as a routine in the examination of all cases of syphilis.

Existence of Two Distinct Physiologic Systems for Transmission of Motor Impulses in Peripheral Nerves.—The two systems described by Hunt are a paleokinetic system subserving the function of automatic and associated movements, and a neokinetic system for isolated synergic movements of cortical origin. He says that there are spinal, striospinal and corticospinal types of motility, all associated and working together harmoniously and representing different stages in the development of the nervous system. According to the hypothesis formulated in the present study, these subdivisions are not confined to the central nervous system but are continued as such in peripheral nerves. The peripheral motor neurones, therefore, include two separate and distinct physiologic systems related, respectively, to the striospinal and the corticospinal systems. The older of these, the paleokinetic system, is engaged in the transmission of the motor impulses of automatic and associated movements, while the more recent neokinetic system conveys the motor impulses of cortical origin. In other words, with the specialization of the central pathways there has been a corresponding specialization and differentiation in peripheral nerves, with the development of separate systems of fibers for striatal and cortical functions. Hunt, therefore, recognizes a continuous corticospinoneural system subserving a neokinetic function and a striospinoneural system subserving the function of paleokinetic motility. It is his belief that these two motor systems are associated with the development of corresponding reflex activities, so that striospinal and corticospinal types of reflexes may be recognized. It would also appear that certain differences in the two classical types of central hypertonus, spasticity and rigidity, e. g., the distribution and nature of the palsy, the associated deformity, the character of the hypertonicity and the alteration in reflex activity, may be explained on the basis of their relationships to the neokinetic and paleokinetic systems. Of special interest is the apparent preponderance of the disk system or sarcostyles in neokinetic motility as contrasted with that of the sarcoplasmic function which predominates in paleokinetic motility. This

suggests that the more highly specialized forms of movement may be associated with an increased functional activity of the disk system.

British Journal of Tuberculosis, London

January, 1919, **13**, No. 1.

Next Step in Tuberculosis Movement. E. W. Hope and others.—p. 1.
Tuberculosis Colony in the Making. P. C. Varrier-Jones.—p. 14.
*Examination of Sputum for Tubercle Bacilli. G. B. Dixon.—p. 22.
Dispensary Supervision in Pulmonary Tuberculosis. G. Jessel.—p. 25.

Examination of Sputum for Tubercle Bacilli.—In Dixon's hands the Ellerman and Erlandsen method of examination of sputum for tubercle bacilli in a series of 945 instances gave 205, or 21 per cent., of positive results which were not demonstrated after one staining alone; and of the 205 positive results so obtained, 146, or 71 per cent., were obtained after the first concentration process, which, Dixon says, should be justification sufficient for the extra work involved, if any.

British Medical Journal, London

Jan. 25, 1919, **1**, No. 3030.

*Herpes Zoster: Cause and Association with Varicella. R. C. Low.—p. 91.
Public Measures for Prevention of Tuberculosis. N. Raw.—p. 92.
*Incidence of Albuminuria and Casts in British Soldiers During Training, and the Relationship of this Condition to War Nephritis. H. MacLean.—p. 94.
Policy of Ostrich (Venereal Disease Regulation). J. G. Adami.—p. 98.
*Life History of Ascaris Lumbricoides. F. H. Stewart.—p. 102.

Etiologic Relationship Between Herpes Zoster and Varicella.—Three cases are cited by Low which seem to show that there is some relationship between herpes zoster and varicella, that the virus of varicella might in certain circumstances, instead of producing a generalized eruption, cause a zoster eruption. He calls attention to the fact (1) that herpes zoster in a household is frequently followed by a case of chickenpox, (2) that cases of chickenpox may be followed by cases of herpes zoster in the same house, and (3) that cases of herpes zoster, in addition to the ordinary lesions, may show an eruption similar to chickenpox, so that one is almost forced to conclude that these two diseases are probably due to the same virus.

Relationship of Albuminuria and Casts to War Nephritis.—Among 50,000 men whose urine was examined, the total percentage of albuminuria (unaccounted for by pus, spermatozoa, blood, etc.) was found to be about 5 per cent. The average percentage of urines found to contain casts was 1.87; of this number 0.84 per cent. had definite epithelial casts, while in 1.03 per cent. hyaline casts only were found. MacLean is fairly certain that at least 132 cases of definite nephritis were returned from among the group of 50,000 men previously examined for albumin. As certain of the other twenty-nine cases were also, probably, suffering from nephritis, the total 161 cases may be taken as the maximum number of individuals who developed nephritis within nine months after being examined at the base. Out of the 161 patients returned as nephritis or albuminuria, only twenty-eight suffered from albuminuria just before going to the front. Of these, seven had epithelial and hyaline casts, while eight had hyaline casts only. Thus, out of the total 161 returns only 17.4 per cent, had albuminuria when examined a few months before they developed nephritis, while only 9.3 per cent. had both protein and casts.

Taking all these results together, it is contended by MacLean that the great majority of the cases that return from the front area as war nephritis do not show albuminuria a few months before contracting the disease. It would, therefore, seem that previous albuminuria plays little or no part in the etiology of war nephritis. The disease arises de novo, and is not an aggravation of some preexisting kidney defect the presence of which can be ascertained by any of the ordinary methods of examination.

Life History of Ascaris Lumbricoides.—Summing up our present knowledge of the larval development of this worm, Stewart says it has now been established that the ripe eggs of ascaris will hatch in the intestine of man, the pig, rat, mouse and guinea-pig, that the larvae enter the blood stream of the host, pass through the liver and heart to the lungs, there migrate from the capillaries into the alveoli, and thence through the bronchi and trachea to the pharynx. They reach the lungs and trachea between the sixth and eighth day after infection. Further, in the mouse the larvae then migrate down the alimentary canal and are passed alive, but not active, in the feces from the tenth to the sixteenth day.

Bulletin of Naval Medical Association of Japan, Tokyo

December, 1918, No. 21.

Grating Fiber in Congested Liver. H. Miyagawa.—p. 1.
Bulgarian Lactic Fermenting Bacillus. J. Ishiguro.—p. 3.
Anaphylaxy Following Inoculation of Bacteria. K. Ushijima.—p. 4.
Hyphomycetes of Eczema Marginatum (in Naval Depot at Kure). S. Imokawa.—p. 6.

Journal of Tropical Medicine and Hygiene, London

Jan. 15, **22**, No. 2.

Common Diseases of Sierra Leone Seen in British Hospitals. W. A. Young.—p. 11.

Lancet, London

Jan. 25, 1919, **2**, No. 4978.

General Practice. J. Pearse.—p. 129.
Accidental Hemorrhage in Connection with Eclampsism; Report of Cases. W. Smyly.—p. 133.
*Differential Diagnosis of Amebic and Bacillary Dysentery from Blood. G. M. Findlay.—p. 135.
Nasal Obstruction in Aviators. D. Guthrie.—p. 136.
*Postinfluenzal Hemoptysis. H. Wilson.—p. 137.
*Staphylococcus Aureus Septicemia Complicating Influenza in Malta. A. Patrick.—p. 137.
*Simply Prepared Culture Media for B. Influenza. A. Fleming.—p. 138.

Differential Diagnosis of Amebic and Bacillary Dysentery from Blood.—In the differentiation of amebic and bacillary types of dysentery the two following reactions have been used by Findlay: (1) the iodin reaction in the polymorphonuclear leukocytes; (2) the production of nuclear pseudopodia in the polymorphonuclear leukocytes. Taken in conjunction, Findlay says, these two tests enable an accurate diagnosis of the type of dysentery at an early stage of the disease in at least 90 per cent. of cases. The occurrence of a well-marked iodin reaction without the formation of nuclear pseudopodia is suggestive of a bacillary infection, while the absence of the iodin reaction and the presence of nuclear pseudopodia naturally point to an amebic origin. Should a well marked iodin reaction occur in conjunction with the formation of nuclear pseudopodia, the possibility of a mixed infection should not be overlooked.

Postinfluenzal Hemoptysis.—As a rule, the hemoptysis in influenzal cases commences toward the end of the illness, when there is a slight cough, an increase in weight, and no great tendency to wasting. The sputum shows a bright red staining, and not the typical rusty tint of acute pneumonia. Pneumococci are the predominant organisms and tubercle bacilli are absent. The characteristic physical signs are generally marked by their bilateral posterior distribution in the suprascapular areas, where breath sounds are faint and moist granular adventitious sounds are abundant, with no bronchial breathing and some bilateral impairment of the percussion note. The corresponding areas in front show little or no change, except some lack of resonance on percussion. The mid area of the lungs posteriorly is fairly clear, but the bases show congestive crepitation on both sides. The temperature, for a time, is irregular and fluctuating, and the pulse rate not so rapid as would be the case in a tubercular bacillary toxemia corresponding to similar physical signs. Careful observation of these cases for a few weeks will show subsidence of physical signs and temperature, with increasing weight and improved general condition. If, therefore, with slight hemoptysis the physical signs are bilateral and chiefly marked posteriorly, Wilson urges that it is well not to be too precipitate in diagnosing pulmonary tuberculosis, but to make frequent examinations of the chest and sputum while taking the general progress of the case into consideration.

Staphylococcus Aureus Septicemia Complicating Influenza in Malta.—The cases in which *Staphylococcus aureus* was found by Patrick were frequently those of a severe type of bronchopneumonia, with characteristic symptoms. The sputum

of fifty patients with influenzal bronchopneumonia was examined bacteriologically. Nine of these fifty patients died, and *Staphyloccus aureus* had been found in the sputum of seven of them. The nine others who had shown staphylococcus recovered, though several had a severe attack. The amount of this organism grown from the sputum of the fatal cases varied, being sometimes a small growth mixed with other organisms, and once an abundant pure culture.

Simply Prepared Culture Medium for B. Influenzae.—Fleming emphasizes the advantages of blood altered in various ways on the growth of *B. influenzae*. He has had the opportunity of seeing and making many cultures of *B. influenzae* on agar with blood digested with trypsin. Wonderfully profuse growths can be obtained from its use. The preparation of the medium is, however, cumbersome, as it takes four or five days for the trypsin to produce the necessary change in the blood. It is thus impracticable to use such a medium if it desired to make cultures of *B. influenzae* without previous warning, unless a stock of the medium is kept on hand. It also requires sterile blood and sterile trypsin, which are not always to hand. Therefore, Fleming devised a medium which could be prepared on the spur of the moment.

If blood is added to a tube of agar and boiled for one minute the whole of the coloring matter of the blood and the coagulable protein is precipitated in masses. The tube can then be sloped, and before the agar cools sufficiently to become solid, the whole of this precipitate will have settled to the bottom, leaving the upper part of the medium clear. If *B. influenzae* is planted on this, an enormous growth results. The same result is obtained if blood corpuscles only are used. If 1 c.c. of blood is boiled with 9 c.c. water, the whole of the coloring matter of the blood and the coaguable protein is precipitated in masses which separate rapidly, leaving a clear, colorless, watery fluid. This fluid is added to liquid nutrient agar and sloped. On planting with *B. influenzae* a very profuse growth takes place. If to blood is added an equal volume of a normal solution of one of the strong mineral acids, such as sulphuric acid, the red color is immediately changed to brown by the breaking down of the hemoglobin. If an equivalent volume of normal caustic soda is added, a brown precipitate is formed and a brownish fluid separates. If this fluid is added to liquid agar, it furnishes a medium on which the most profuse cultures of *B. influenzae* can be obtained. It would appear, therefore, that so far as the growth of *B. influenzae* is concerned, sulphuric acid will effect the same change in blood in less than one minute that it takes trypsin four or five days to produce.

From the media described above very good emulsions of the bacillus can be obtained for agglutination purposes. By the addition of brilliant green to the medium, pneumococci, streptococci and staphylococci are inhibited to a much greater extent than is *B. influenzae*. Cultures of *B. influenzae* can be kept alive for a considerable period on a blood meat medium. The blood of all the patients tested by Fleming who were suffering from influenza agglutinated *B. influenzae*.

Bulletin de l'Académie de Médecine, Paris

Dec. 31, 1918, **80**, No. 52

Pneumonia in Influenza. F. Rathery and David.—p. 653.
*Stereoscopic Photography of Tympanum. Molinié.—p. 655.
*Spirillum Gangrene of Lung. P. Nolf.—p. 657.

Photography of the Tympanum.—Molinié relates, without particulars, that he has ascertained the angle of incidence for photography at the shortest distance, and has thus been enabled to photograph the tympanum with minutest details, and make stereoscopic views of it. These views are invaluable for teaching otology, and may have forensic import at times, as well as serving for historical records of war aerial shocks, etc.

Spirillum Gangrene of Lung.—Nolf has previously reported cases of fetid bronchitis due to spirilla and he here adds another to the list. The spirillar bronchitis followed influenzal bronchopneumonia, and necropsy revealed gangrene of the inferior lobe of the left lung. The microbe involved was probably an ordinary spirillum from the mouth or pharynx. There were evidences of pyorrhea alveolaris.

Journal de Chirurgie, Paris

December, 1918, **15**, No. 7

*Healing of Wounds. T. Tuffier and R. Desmarres.—p. 1.
Early Suture with War Fractures of Long Bones. G. Picot.—p. 15.
Suspension for Fractured Femur. Antoine and Masmonteil.—p. 22.

Healing of War Wounds.—Tuffier and Desmarres made a special study of the rate of healing in thirty cases of war wounds, applying various disinfectants, etc., with chart records showing the units of healing day by day. They found a marked tendency to separation into two phases. In the first phase, the destruction of the microbes is imperative, and everything to favor this is demanded. But when the microbes are once conquered, there is no further need for disinfectants, and their main effect then is to damage the delicate tissues forming in repair. Merely a dry absorbent dressing is called for then, but systematic exposure to the sunlight in their cases much shortened the period of healing. In some of their cases the healing expectancy of thirty-five days was shortened by fifteen days by heliotherapy.

Journal de Médecine de Bordeaux

December, 1918, **89**, No. 12

*Oscillometry in Transfusion. Maury and Soulé.—p. 347.
*Case of Rat Bite Fever. E. Secousse.—p. 349.
Ligation of Internal Carotid. Brau-Tapie.—p. 351.
Anesthesia to Electric Burn. R. Fabre.—p. 352.
Orthopedic Apparatus Made of Rattan. Cheyrou.—p. 354.
Pleural Effusions. G. Dubreuil.—p. 356.
A Serbian Neurologic Center. A. Hesnard.—p. 358.

The Oscillometer as a Guide for Transfusion.—Maury and Soulé compared the arterial pressure findings with the excursions of the needle of Pachon's oscillometer. This enabled important deductions to be drawn as to the need or not of transfusion. No other means of investigation will reveal the minute differences which represent the difference between adequate and inadequate circulation in cases of severe hemorrhage, etc.

Rat-Bite Fever.—Secousse reports a typical case of characteristic fever following a rat bite. The young second lieutenant was left with much depression and albuminuria after subsidence of the disease.

Paris Médical

Dec. 21, 1918, **8**, No. 51

*Rapid Cure of Causalgia. Lortat-Jacob and E. Girou.—p. 493.
Dermatitis as Factor in Trench Foot. Gougerot.—p. 495.
Apparatus for Fractured Humerus. Hallopeau, Auvigne, Ferrier and Gouverneur.—p. 500.
Technic for Epididymectomy. Uteau.—p. 503.

Ligation of Nerve for Causalgia.—Lortat-Jacob and Girou report that the pain with painful paralysis of the median nerve has subsided promptly and permanently in their experience after a catgut has been thrown around the nerve. This procedure was applied only in the particularly painful and absolutely rebellious cases of long standing, with grave and persisting modifications in the electric reactions. The ligature is applied above the lesions and the pain disappears within the same day. The catgut is absorbed but the effect persists.

Presse Médicale, Paris

Jan. 2, 1919, **27**, No. 1

*The "Vertigo That Restores Hearing." M. Lermoyez.—p. 1.
*Neuroses of the Diaphragm. D. Denéchau.—p. 3.
*Phlebitis and Septicemia. Dehelly.—p. 5.

Jan. 9, 1919, **27**, No. 2

*Effectual Drainage of the Pleura. L. Chevrier.—p. 9.
*Biologic Phenomena from Foreign Bodies. L. Ambard.—p. 11.
*Gage for Roentgen Exposures. T. Nogier.—p. 15.
*Regional Anesthesia for Amputation of Breast. G. Labat.—p. 16.

The "Vertigo That Restores Hearing."—Lermoyez has encountered a number of cases in which the ear had evidently become congested, and there was a tendency to tinnitus while the hearing grew less and less to apparently complete deafness. Then suddenly there was an attack of extreme dizziness, and as this passed off it was found that the hearing was approximately normal once more. He describes in detail three cases of the kind in men from 38 to 50. The mechanism seems to be like that in the foot when it "goes dead" from

angiospasm, the result of extreme cold or emotional stress. The toes grow white and there is no feeling in them. But if the limb is rapidly heated, the blood rushes in, the toes grow red, and formication and sharp pain follow. For the latter, the French have a term, *onglée*. The inrushing blood restores conditions to practically normal and there is no further angiospasm. It is liable to recur, however, under the same circumstances.

Some of his patients had had a number of recurrences of the whole set of symptoms, the deafness and the sweeping away of the deafness, with the *onglée* of the labyrinth. The gradual obstruction or closure of the internal auditory artery entailed the progressive anesthesia of the ear, that is, the deafness. When the spasm suddenly subsides, the blood rushes into the labyrinth, and this sudden flood of blood which, in fingers and toes produces a sharp pain, in the labyrinth induces the special pain of the cochlear organ, manifested as tinnitus, and the special suffering of the vestibular apparatus, which is manifested as vertigo. It puts an end at the same time to the anesthesia of the ear, that is to say, to the deafness. The set of symptoms is exactly the reverse of what occurs in Menière's disease. With the latter the hearing is good; then comes sudden vertigo, and after this the gradual decline of the hearing. With the vertigo which Lermoyez describes, the hearing gradually grows poorer and poorer; then comes a severe attack of vertigo, and hearing is restored. The paroxysmal character of these disturbances excludes a permanent lesion like a hemorrhage. One of his patients sought voluntarily to bring on the attack of vertigo by whirling and loud noises, knowing that the attack restored his hearing for a certain time. In two women of 45 and 70 there seemed to be a combination of deafness of the Menière type along with deafness of the Lermoyez type.

Neuroses of the Diaphragm.—Denéchau refers in particular to cases of "big belly" or accordion abdomen in soldiers. His illustrations show the special type of distention as the result of derangement of the innervation of the diaphragm. In fully two fifths of his cases the label of tuberculous peritonitis had been affixed. The diagnosis is very simple if the possibility of a neurosis of the diaphragm is suspected. Treatment should be as for neuroses in general.

Septicemia from Phlebitis.—Dehelly reports a case which shows that septicemia may not be actual infection of the blood but may be merely the result of the pouring into the circulation of germs from some single focus. In his case this was an unsuspected phlebitis in the stump after amputation of the leg. When a second amputation was done higher up, thus cutting off the focus, there was no further septicemia. The discovery of the focus of phlebitis in the amputated segment of the limb was a surprise.

Drainage of the Pleura.—Chevrier's thirteen illustrations show the inefficiency of the usual modes of draining the pleura, and the superiority of the technic he describes, with the drainage provided at the very lowest point of what he calls the *vertébro-costale gouttière*, that is, the gutter formed by the curve of the ribs as they join the spine, the subject lying on his side or back. He first makes an exploratory incision and afterward a second purely for drainage, at the point where he has worked his finger through the first incision down to the very lowest point of this lowest space. He sends medicated vapors through from one incision to the other as the easiest means for sterilization of all recesses, and extols this combination as the best means for treatment of purulent pleurisy. A pleurotomy cannot be depended on to drain effectually except in the angulocostal line at the bottom of the vertebrocostal gutter, and at the very lowest point of this gutter, the patient lying on the sound side.

Duration of Biologic Phenomena after Introduction of Foreign Substance into the Organism.—Ambard comments on the great variability of the phenomena which follow the introduction of drugs or immune serums into the organism, and remarks that the ureosecretory coefficient allows these phenomena to be studied with much precision when the substance introduced passes out through the kidneys practically unmodified. For drugs, this eventuality is constant; for immune serums it is only hypothetical. The smallest dose of a drug that displays any apparent action, the liminal dose, as he calls it, must be reached before we can estimate the duration of its action. For example, if 0.20 gm. is the liminal dose of theobromin, and if 2 gm. is ingested at one dose, then the duration of its action will be the time necessary for elimination of 2 gm. minus 0.20 gm., that is, 1.80 gm. He reports research along this line from which emerges the law that the absolute value of the liminal dose is the principal element which determines the duration of the action of a drug. When more than ten times the liminal dose has been surpassed, the duration of its action increases very little, even for doses very much larger. The ureosecretory coefficient has been applied to the study of urea, ammonia, iodin, glucose and glycerin, and now Ambard has applied it to the study of the immune substances in so far as they are eliminated by the kidneys. This research has given him a new conception of anaphylaxis, as he describes. He now regards it as a sudden disintoxication. It is analogous to the phenomena observed when a morphin addict is suddenly deprived of morphin, only that in the latter case the disintoxication of the centers is accomplished by the kidney functioning alone, while in anaphylaxis the disintoxication of the centers is due to the drawing out of the toxic substances fastened to the centers. This drawing out of the toxic substances is done by another substance which has an affinity for them. This auxiliary hypothesis of the anaphylactic shock is the logical outcome of mathematical calculations, and it explains how a small preliminary dose of the immune serum wards off the anaphylactic shock by rendering the transition less abrupt.

Color Scale for Roentgen Exposures.—Nogier describes the Bordier chromoradiometer and states that he has used it in thousands of cases since 1906, and has always found it reliable. It is the only gage of the kind which is based on a scientifically defined unit. This unit should be substituted for the inexact methods in vogue otherwise, and particularly for the unit H. The unit used by Bordier is the amount of the rays which are capable of setting free 0.1 mg. of iodin in 1 c.c. of a 2 per cent. solution of iodoform in chloroform in a thickness of 1 c.c. shaded from the light. The dose of the rays is estimated by a pastille reagent of platinocyanid of barium. This is placed on the skin and the tint compared with the units of the color scale of the Bordier radiometer.

Regional Anesthesia for Amputation of the Breast.—Labat presents an illustrated description of the technic for infiltration of the skin and blocking the brachial plexus and the intercostal nerves, plus subcutaneous infiltration of the whole vast field of operation.

Correspondenz-Blatt für Schweizer Aerzte, Basel

Dec. 28, 1918, **48**, No. 52

*Influenza. F. Wanner.—p. 1729.
Transmissibility of Condyloma Acuminatum. Tièche.—p. 1743.
*Toxic Injury of Eye. E. Ammann.—p. 1747.
Hydrotherapy of Malaria. T. Zangger.—p. 1751.

Jan. 4, 1919, **49**, No. 1

*Influenza. H. Sahli.—p. 1.
*Lymphosarcomatosis and Leukemia. K. Schnyder.—p. 18.

Treatment of Influenza.—Wanner insists that the physician can do much to hasten recovery in influenza, helping to ward off complications on the part of the lungs and heart, to stimulate repair in lung and pleura, and promote the action of the whole apparatus of defense. This principle once recognized, each can apply it as he thinks best. When the patient has high fever and intense congestion from the start, Wanner gives hot drinks in abundance, and wraps in a large cold pack renewed every two hours. When the temperature has been reduced to 39 C., he gives hot packs instead of cold ones, with cataplasms, cupping, etc. He seeks to realize by these measures hyperemia in the organs racked by the disease. None of Wanner's patients with simple bronchitis complicating influenza died except one man of 70 with emphysema and enlarged prostate. The patient must have plenty of space; the wards must not be allowed to become crowded, and, above all, no case of pneumonia must be left in contact with cases of simple influenza. The light cases, the pneumonia complication cases, and the convalescents should all be in separate wards. When an influenza patient developed pneu-

monia. Wanner found that those around him developed it too, or the effect was seen in a peak in the temperature charts even when there were no durable results. He had a number of cases of pneumonia in which relapses occurred when the patients seemed to be well on the way to recovery but had been left in the same room with other cases of florid pneumonia. After these experiences, he made a point of removing the convalescents as soon as possible from contact with florid pneumonia. From the standpoint of contagion, the bronchopneumonia of influenza seems to behave like that of measles or whooping cough.

The damage from the toxins on the heart and circulation has to be combated at once. Camphorated oil in large doses should be given early, possibly digitalis, or caffein. The packs, cataplasms and cupping aid in the resorption of the exudation in the parenchyma of the lungs. Many patients with double pneumonia were thus tided past the danger point. One woman was brought in with bilateral pneumonia, dilatation of the heart and intense cyanosis, and was at the fifth month of pregnancy, but she left the hospital the twenty-fifth day, completely cured, the pregnancy continuing apparently unmodified. In the intensely toxic cases with a tendency to paralysis of the vasomotor centers, he found the effectual treatment was with epinephrin. Subcutaneous or intravenous injections of 0.001 gm. several times a day kept the pulse going well but did not modify conditions in the lungs. A fixation abscess seemed to do good service in some cases.

Industrial Poisoning of the Eyes.—Ammann reports injury of the eyes of certain workmen in a shoe factory from a substance used as a substitute for acetone oil in making patent leather parts of shoes. The injurious element in the new substance seemed to be chloracetone. In another establishment, a dye works, ammonium persulphate had been used instead of the usual sodium chromate. None of the workmen experienced any ill effects, but the proprietor developed a vesicular eruption on the skin, and blisters on the corneas. The man from whom the chemical was bought also displayed the same idiosyncrasy to the vicinity of the chemical, but the men handling it escaped. Ammann also describes a case in which ptomain poisoning from rotten beef caused ulceration of the cornea and fatal gastro-intestinal intoxication in one man. His son survived the intoxication, but he also developed ulceration in the cornea, reducing vision permanently to 1/25 right and finger counting at 20 inches left. Pflüger has published a similar case from eating spoiled cheese. Hegner has also reported a case of necrosis of the cornea after injections of salvarsan. Wessely and Köllner injected an alien serum intralamellar in a rabbit's cornea and parenchymatous keratitis developed. The incubation period of from five to nine days was the same as in Ammann's ptomain poisoning case.

Influenza.—Sahli proposes a theory in explanation of influenza which, he says, is found exclusively on facts. These facts are that bacteria seem to thrive better in mixed cultures; that influenza seems to be a mixed infection in the widest sense of the term; that the virulence of bacteria is influenced by other bacteria; that the virulence is enhanced by the receptivity of the organism—in other words by repeated passages through the animal body; that there may be a specific individual receptivity; that infections and especially droplet infections do not occur with a single bacterium but always with a number of bacteria, which are often of mixed species; that these mixed bacteria are liable to form a complex virus; that mixed cultures are liable to separate and turn into a single culture—both in the living body and in the test tube; that the main, the trunk epidemic may branch into various diverging subsidiary epidemics—these are all established facts, and especially well established for influenza. They explain influenza to be an obligate complex infection. The pneumococcus, the streptococcus, the influenza bacillus—possibly still others—form the obligate group, a symbiosis, a higher unit, which infects the organism as a unit. After infection has occurred, one or the other member of the group may develop preferentially. In one of his cases the sputum was swarming with influenza bacilli one day, and the next day the sputum was a thick pure culture of the pneumococcus. The complex virus, in twenty-four hours, had become completely transformed in the course of the single infection. This theory of an obligate complex virus throws light on the various features of influenza, as Sahli explains in detail. If an ultramicroscopic germ should yet be discovered, this would not invalidate the theory, but merely add another member to the group forming the obligate complex virus unit.

Lymphosarcomatosis.—Schnyder analyzes the special features of a case of generalized lymphosarcomatosis in a youth of 17 with lymphatic leukemia. A large tumor in the mediastinum, possibly originating in the thymus, with metastasis in lymph glands, kidneys, liver, gallbladder and dura, was accompanied by diffuse hyperplasia of the tonsils and base of the tongue, suggesting a leukemic or pseudoleukemic process. Similar findings were evident in the spleen.

Pediatria, Naples

January, 1919, **27**, No. 1

*Immunization against Scarlet Fever. G. di Cristina and R. Pastore.—p. 1.
*Palate Sign of Inherited Syphilis. D. Tanturri.—p. 4.
*Congenital Syphilids in the Lungs. A. F. Canelli.—p. 11.
*The Blood in Infantile Sepsis. G. Milio.—p. 33.

Children Successfully Vaccinated Against Scarlet Fever.—Di Cristina's further experience has apparently confirmed the efficacy of the serovaccine obtained from the desquamated scales of scarlet fever patients. They seem to contain an antibody which, he says, appears to ensure immunity to the disease when injected subcutaneously. Horses treated with it developed antibodies in their serum to an amboceptor power of 2,000. For details of the technic he refers to his communication in 1916 (briefly summarized in THE JOURNAL, Sept. 30, 1916, p. 1049). Of forty children immunized by this means and left in the same room, sleeping in the same bed, with scarlet fever patients, not one contracted the disease. Of twenty-five children in families where there was a case of the disease, not one contracted it, and no case of scarlet fever developed in the hospital wards after the disease had been imported. Di Cristina and Pastore now announce that the method has stood so many tests that this immune prophylaxis against scarlet fever can be applied on a large scale. They have never witnessed any by-effects from it except very rarely a slight fleeting eruption—evidently an anaphylactic phenomenon—which might suggest scarlet fever if it were not for its rapid subsidence and the absence of all throat symptoms and fever. The children thus immunized have been followed for six months, and the continued presence of the induced amboceptors has been confirmed to date.

Palate Sign of Inherited Syphilis.—Tanturri has noticed that with inherited syphilis the edge of the soft palate as it arches over to the uvula has a characteristically irregular outline. Instead of forming a smooth edge, it looks dentated, as if both epithelial tissue and mucosa had been eroded. There may be loss of substance for 1 or 2 mm. from the edge, but the flexibility of the parts and the color are not modified. Those presenting it were of all ages, from the newly born to 20 years old, and he asserts that this eroded outline of the palate arch on both sides may be accepted as positive testimony to the existence of inherited syphilis. In seven newly born, with serious manifestations of inherited syphilis, this lacelike outline of the palate was exceptionally pronounced.

Congenital Syphilitic Lesions in the Lungs.—Canelli analyzes the literature on this subject, with three pages of bibliography, and describes the various types of syphilitic changes in the lungs. They are practically always fatal.

The Blood in Sepsis in Infants.—Milio's research on four healthy infants and on eleven with sepsis demonstrated that the blood in sepsis shows leukocytosis but not always polynucleosis. The specific gravity was found increased in 70 per cent. of the infants; the viscosity is reduced but coagulation occurs sooner than in normal blood. There does not seem to be any change in the percentage of water.

Policlinico, Rome

Jan. 12, 1919, **26**, No. 2

Influenza. C. Artom.—p. 33.
Case of Aphasia in Typhoid Fever. P. de Tommasi.—p. 36.

Fistula and Other Lesions of Penis from Ring Slipped on during Sleep as a Practical Joke. R. Botteselle.—p. 37.
*Conservative Treatment of Surgical Tuberculosis. G. Aperlo.—p. 40.

Conservative Treatment of Surgical Tuberculosis.—Aperlo pleads for early adequate organization of measures throughout Italy to combat surgical tuberculosis, especially glandular, bone and joint processes. He urges organization on an adequate scale of sea shore and other sanatoriums where heliotherapy, etc., can be systematically applied.

Riforma Medica, Naples

Dec. 14, 1918, **34**, No. 50

*Action of Chloroform on the Suprarenals. V. Aloi.—p. 990.
The Three Clinical Types of Influenza. G. Sofrè.—p. 991.
Diagnosis of Urologic Albumin. O. Cantelli.—p. 993.
Referendum on Influenza. G. Zagari and others.—p. 995.
Present Status of Obstetric Craniotomy. E. Aievoli.—p. 997.

Dec. 21, 1918, **34**, No. 51

*Gallstones and Mineral Waters. C. Fedeli and O. Torri.—p. 1010.
The Streptococcus in the First Phase of the Evolution of War Wounds. L. Durante.—p. 1014.
Mercuric Chlorid by the Vein in Influenza. A. Togliani.—p. 1018.
Present Status of Surgery for Internal Hydrocephalus. E. Aievoli. —p. 1019.

Action of Chloroform on Suprarenals.—Aloi's experiments confirm that chloroform induces increased production of epinephrin in the suprarenals. The epinephrin is poured out into the circulation, so that the suprarenals in this phase seem to have become exhausted and show very little epinephrin.

Gallstones and Hypercholesterolemia.—Fedeli and Torri have been conducting research with the mineral waters at Montecatini which are noted for their action in cholelithiasis. The metabolic findings and the course in six cases under the influence of the waters are reported in detail. The cholesterol content of the blood was much increased in all, and in every case it sank to normal figures under the influence of the spa treatment. Experimental research confirmed the clinical findings; all testifying that the saline-alkaline waters stimulate the secretion of bile; the less concentrated of the waters are more effectual in this respect, rendering the bile more fluid. This in turn helps to wash out the cholesterol, and the cholesterol content in the blood declines. At the same time the waters modify the general metabolism.

Annaes Paulistas de Medicina e Cirurgia, S. Paulo

July, 1918, **9**, No. 7

*Vaccine Therapy of Whooping Cough. T. Bayma.—p. 145.
Typhoid at S. Paulo. B. R. Pastana.—p. 149. Conc'n.

August, 1918, **9**, No. 8

Trachoma. J. Britto.—p. 169.
*Urinary Amebiasis. T. Bayma and A. Fagundes.—p. 173.

September, 1918, **9**, No. 9

*Typhoid Meningitis. A. P. U. Cintra.—p. 193.
*Nasal Diphtheria. P. Santos.—p. 202.

Vaccine Treatment of Pertussis.—Bayma was skeptical as to the efficacy of the autogenous vaccine prepared by Kraus from the sputum of whooping cough patients, but his experiences with this "antitossina" soon converted him. He made the vaccine from the whole sputum instead of using—like Kraus—merely the threads of mucus. His official report states that in the forty-seven cases given this treatment a cure was realized, and that it is to date the most effectual means for treating whooping cough yet known. This is his dictum from experience with hundreds of cases, and from the experience of others. Fully 3,500 c.c. of this vaccine was prepared at the Institute of Bacteriology, in his charge, and 2,200 c.c. of it was used by other clinicians.

Urinary Amebiasis.—Bayma and Fagundes relate that in the course of 1918 they found amebas in the urine from three patients. The total absence of symptoms from the bladder in two cases suggests fecal contamination of the urine. In the third case there was severe acute cystitis, and living amebas were found in both urine and stools. Epinephrin was given by the mouth (Bayma's method), and the bladder was flushed with the 1 per thousand solution. The bladder functioning promptly returned to normal, confirming anew, they say, the potency of epinephrin in human amebiasis.

Typhoid Meningitis.—Cintra reproduces Bayne Jones' tabulation of seventeen cases of purulent meningitis of typhoid origin, and adds several more he has compiled and one case from his own experience, bringing the total to twenty-seven recorded since 1901. Seventeen were recorded before that; thus there are forty known cases to date. This complication may occur at almost any stage of typhoid, and a fatal outcome is the rule. In exceptional cases the meningitis may be the first manifestation of the infection. In this case the clinical picture is that of meningococcus meningitis, as in his personal case. The man died the second day, the fifth day of his sickness, and typhoid bacilli were found in the cerebrospinal fluid. The localization of the germs in the meninges may be facilitated by some predisposing factor. The Wassermann reaction in this case was positive and there were other signs of syphilis. In the twenty-seven tabulated cases all but two proved fatal. One adult recovered after an operation, the meningitis having been restricted to the lumbar region. Another recovered from a subacute meningitis. The list includes three cases of primary acute meningitis, including Cintra's case, without intestinal lesions.

Nasal Diphtheria.—Santos has found diphtheria bacilli in the nose of infants more often than in the throat, a primary diphtheria of the nares being comparatively common in infants exposed to infection. It is almost invariably mild, but it may be followed by secondary diphtheria of the throat, and the mild nasal diphtheria may give rise to severe diphtheria in others. Association with streptococci renders the outlook graver. He calls attention to nasal diphtheria to emphasize the importance of isolation, and the necessity for school physicians and others to examine the nose as well as the throat of children.

Boletin de la Asoc. Med. de Puerto Rico, San Juan

December, 1918, **14**, No. 121

*Influenza in Porto Rico. F. del Valle Atiles.—p. 279.
Hydronephrosis from Calculus in Ureter. J. Avilés.—p. 286.

Influenza in Porto Rico.—Atiles relates that influenza appeared in Porto Rico in June soon after the arrival of a ship from Spain. It spread rapidly, and it is estimated that at one time fully 8 per cent. of the entire population had the disease simultaneously, and that 40 per cent. of the population were affected during the epidemic. Of the 250 physicians practicing in the island, 60 per cent. contracted the disease. All forms of the disease were encountered, from the mildest to the severest respiratory, gastro-intestinal and nervous forms, with predominance of the pneumonic type. The mortality was at least 2 per cent. In about 70 per cent. of the cases recovery occurred under serotherapy. The damage from alcohol given by the family against the physician's orders was particularly striking in the case of one girl with meningitis complicating influenza. Death followed almost at once. With the exception of serotherapy, treatment was only symptomatic; antistreptococcus serum proved very useful.

Brazil-Medico, Rio de Janeiro

Nov. 16, 1918, **32**, No. 46

*Operations on Syphilitics. J. de Mendonça.—p. 361.

Nov. 23, 1918, **32**, No. 47

Brazilian Gregarinas. (Bothriopsis Pirajia, n. sp.) Hasselmann.—p. 369.
Dermatology in Brazil. F. Terra.—p. 369.

Nov. 30, 1918, **32**, No. 48

*Experimental Research on Influenza. A. Marques da Cunha, O. Magalhães and O. da Fonseca.—p. 377.
Meningocele. A. F. de Magalhães.—p. 379.

Dec. 7, 1918, **32**, No. 49

Myxosporidia of Brazilian Fishes. O. M. da Cunha and O. da Fonseca. —p. 385.
*Blood Corpuscles in Yellow Fever. C. Fraga and A. S. Tavares. —p. 385.
*Abdominal Pain with Incipient Pneumonia and Febrile Rheumatism. O. Clark.—p. 388.

Surgery in Syphilis.—De Mendonça discusses both surgery for syphilitic lesions and the influence of syphilis on healing after any operation. In case of doubt in regard to the nature of tumors in the anorectal region—which are often extremely

difficult to differentiate and often prove refractory to specific treatment—it is better to remove them even if time should demonstrate that the operation was unnecessary, rather than expose the patient to danger of metastasis from a sarcoma. He describes seven cases of this type of anorectal syphiloma. One man of 30 applied for treatment of hemorrhoids. The rectum showed lesions suspicious of syphilis, and specific treatment was advised preliminary to any operation. The man refused and was operated on in another town. A few months later he returned with advanced rectitis with profuse purulent secretion, and he died within a few months, the diagnosis still in doubt. This was before the days of the Wassermann reaction. In a second, equally unfavorable case, the patient was a man of 21 and the rectum, perineum and cellular tissue of the lower portion of the pelvis formed a single agglomeration, studded with fistulas.

An operation was done on a man of 40 for stenosis of the rectum, in 1913, but the rectitis persisted and grew constantly worse. The man had a history of syphilis but the Wassermann reaction was constantly negative. Specific treatment brought great improvement in the general health but the rectum had to be resected. In another young man with rectitis and stricture, improvement to recovery followed an operation for hemorrhoids and slitting the stricture. One patient in the group was a woman of 38 with a syphilitic husband. With a temporary artificial anus and specific treatment improvement was realized. Some surgeons maintain that syphilis does not retard the healing of wounds, but Mendonça's experience has convinced him that syphilis, as well as other constitutional diseases, is liable to exert a most unfavorable influence on operations, especially laparotomies. In three recent cases, the laparotomy wound opened again, or there was dilatation of stomach and intestines. The Wassermann reaction was strongly positive, and under specific treatment healing proceeded further without mishaps. Other instances are reported of complications in skin, etc., developing after operations on syphilitics, all emphasizing the wisdom of a course of specific treatment before attempting any operation on syphilitics.

Vaccine Therapy of Influenza.—Da Cunha and his co-workers inoculated monkeys with blood and sputum from influenza patients after filtering through a Berkefeld or Chamberland F candle. The temperature ran up afterwards to above 104 F. in one of the monkeys. In a second monkey there was fever but not quite so high. The blood from influenza patients induced a febrile reaction when injected in guinea-pigs. Inoculation of two men and one monkey with Pfeiffer's bacillus cultivated from the influenza patients was always negative. The monkeys first experimented on were inoculated anew with the sputum filtrate, but without any temperature response. This and other facts cited suggested the feasibility of vaccine treatment of influenza, using the sputum filtrate for the purpose, as a vaccine containing the ultramicroscopic microbe. They have not applied this vaccine in prophylaxis in the human, but the experiments on animals seem promising, and Nicolle and Lebailly have reported successful experiments in this line.

The Blood in Yellow Fever.—Fraga agrees with Couto and Sodré that the cause of the jaundice in yellow fever is to be sought in the blood. It is not due to any special fragility of the reds but to their destruction by the extremely toxic yellow fever virus, acting probably on the lipoids of the corpuscle membrane, with possibly a hemolysinic hemolysis.

Abdominal Pain at Onset of Febrile Rheumatism and Pneumonia.—Clark relates several instances of acute articular rheumatism in children which began with a sudden and intense pain in the abdomen, the child saying the pain was like a blow. In other cases this sudden intense pain opened the clinical picture of influenzal bronchopneumonia. Pneumonia in one young man started with such distressing vomiting and intense abdominal pain that death seemed imminent, but he had quite recovered by the end of the second week. Pleurisy and pericarditis may start with intense abdominal pain, and two cases were published last year in which infarction of the heart simulated acute surgical abdominal conditions.

Gaceta Medica de Caracas

Nov. 30, 1918, **25**, No. 22

*Date of Fecundation. L. Razetti.—p. 232.
*Epidemic of Influenza. J. de D. V. Ruiz.—p. 233.

Date of Fecundation.—Razetti discusses the various theories in vogue and rejects all except those which accept the menstrual function as a preparation of the uterus for the embedding of the ovum. The internal secretion of the corpus luteum is what starts this preparation. According to this theory, there is no ripe follicle in the ovary during menstruation, and hence fecundation during this period is impossible.

Influenza in Venezuela.—Ruiz reviews his experiences at Macuto "during this terrible epidemic that is still keeping us in distressful armed expectation." The three other doctors in the town were down with the epidemic, and Ruiz had scarcely a moment's respite during those unforgettable days until the authorities sent from elsewhere other physicians to his aid. The eight deaths among 400 cases were of the septicemic type, with pneumonia under way before he saw them. He was impressed by the constantly slow pulse with good tension, in marked contrast to the extremely high fever, in all his cases except very young infants and the very old. A pulse of 54 to 85 accompanied temperatures up to 40 C. In certain convalescents from the thoracic form he found a pulse of 38 and 40 C. with a temperature under the tongue of 36 C. One patient, on the other hand, presented alarming tachycardia but it became transformed at once into bradycardia under a digitalis preparation. The slow pulse seemed always to be a favorable sign, as Ruiz has always found it associated with a good prognosis in yellow fever. It seems as if the virus causing the disease affected the medulla oblongata from the start. Strychnin was his main reliance for a tonic.

Medicina Ibera, Madrid

Nov. 2, 1918, **5**, No. 52

Neoarsphenamin. J. S. de Grado.—p. 102.

Nov. 9, 1918, **5**, No. 53

*Influenza. R. Velasco.—p. 128; R. Arroyo.—p. 129.
Iodin for Internal Use. A. S. Alvarez.—p. 130.

Nov 16, 1918, **5**, No. 54

*Functional Retention of Urine. A. Pulido Martin.—p. 157.
Segmentation of Cadaver for Teaching Purposes. S. Sierra y Val.—p. 158.

Influenza.—Velasco remarks in these "Clinical Impressions" of the epidemic that influenza certainly confers immunity, as those who contracted the disease when it appeared in the spring escaped it when the epidemic flared up again in the fall, and vice versa. Another feature that impressed him was that the elderly usually escaped and when they did contract the disease it generally assumed a mild form in them. He noticed further that in every case in which there was intestinal hemorrhage, the outcome was favorable. The hemorrhages occurred between the twenty-fourth and sixtieth hours, presumably before ulceration could have developed. Some great change in the composition of the blood seems more probable.

Functional Retention of Urine in Woman.—Martin reports the case of a woman of 60, otherwise healthy, who every three or four years has had complete retention of urine lasting for four to six days, conditions then returning to clinically normal. The cystoscope revealed finally a minute papilloma, no larger than the head of a pin. This probably acted like a foreign body at times, setting up spasmodic contraction in the sphincter. It is possible, he adds, that closer search for some minute excrescence or lesion might upset the diagnosis of hysteria in a certain proportion of cases.

Prensa Medica Argentina, Buenos Aires

Nov. 30, 1918, **5**, No. 18

Vestibular Nystagmus. R. Argañaraz.—p. 177. Cont'n.
Epidemic of Influenza. R. Kraus and L. Kantor.—p. 181.
*Tartar Emetic Cures Papillomas. S. Mazza.—p. 183.

Tartar Emetic Treatment of Papillomas.—Mazza's further experience has confirmed his statements that tartar emetic by the vein is a specific for papillomatous lesions. Seven illustrations of one case show the complete retrogression of

a large crop of pointed condilomas. The drug is given in a 1 per cent. aqueous solution, sterilized by filtering through a Berkefeld filter. In the case described, twenty-four intravenous injections of 5 c.c. each realized the complete cure with no signs of recurrence during the ten months since.

Revista de la Asoc. Med. Argentina, Buenos Aires

September-October, 1918, **29**, No. 166-167

Spastic Constipation. J. Mendez.—p. 348.
Constipation. J. M. Escalier.—p. 363.
Surgery for Chronic Constipation. C. R. Lavalle.—p. 384.
*Factors in Chronic Constipation. C. B. Udaondo.—p. 398.
Classification of Constipation. R. Novaro.—p. 412.
*Surgery for Chronic Constipation. G. B. Arana.—p. 437.
*Medical Treatment of Habitual Constipation. I. Ymaz.—p. 492.

Chronic Constipation.—Recently the Asociacion Medica Argentina held a three day meeting for a thorough discussion of chronic constipation from all points of view. Udaondo emphasized the frequency of stomach derangement, especially motor insufficiency, as accompanying constipation. There seems to be a rupture of the gastro-intestinal functional correlations. Hyperacidity was exceptionally frequent in his cases of chronic constipation, as well as other symptoms indicating a neurosis of the vagus. This may disturb the functioning at almost any point in the digestive tract, spastic conditions or atony hindering the normal passage of stomach and bowel contents, and entailing acidity. In a number of cases tobacco seemed to be responsible for the irritation of the nerves, as conditions righted themselves when tobacco was dropped. The deleterious influence of tobacco was particularly manifest in cases in which spastic colitis was the principal manifestation of the hypervagotony. Arana discussed the surgical treatment for pericolitis and megacolon, and reported eight typical cases with illustrations. Ymaz emphasized that rational medical treatment of habitual constipation is possible only when the exact cause has been ascertained. He reviewed the medical field and warned that a diet to give more bulk to the feces must not be carried to extremes, as too large a quantity of indigestible tissues probably injures the mucosa more than a mild chemical stimulus. Morena remarked that pericolic membranes are a frequent finding at necropsies of children with a tendency to so-called chronic appendicitis. He has encountered in children all kinds of pericolitis and abnormally large cecum, colon, etc., and in nearly every instance there were attacks of pains or a chronic pain. But very seldom did these children display any tendency to chronic constipation. These findings sustain the assumption of the frqeuent congenital origin of these lesions.

Revista Española de Medicina y Cirugia, Barcelona

December, 1918, **1**, No. 6

*Radium for Cancer of Upper Air Passages. R. Botey.—p. 275.
*Bronchopneumonia in Children. E. Suñer.—p. 289.

Radium Treatment of Cancer of Upper Air Passages.—Botey gives an illustrated description of his methods for using radium. His experience has been that superficial epithelioma of the nose has usually been completely cured by six exposures of from thirty to sixty minutes each, at intervals of from four to seven days. His results were mediocre with epithelioma of the cheek and in the nose. There is no doubt that in treatment of cancer of the larynx small doses of radium with long exposures are not nearly so effectual as large doses for a few hours. But these large doses, even for a short period, induce such a secondary reaction that the method has to be abandoned. If the radium could act alike on all the cells of the cancer, the cure would be complete, but the deeper lying cells are not destroyed, and the effect on them is only to stimulate them. Metastasis and recurrence are more frequent than after a radical operation. The latter if done early, before there is glandular involvement, is still as ever, he reiterates, the best treatment. Radium treatment after operation aids in warding off recurrence. Radium applied directly to a cancer in the esophagus improves conditions for some months but the disease continues its course. In the upper air passages and larynx, superficial cancers not extending into the depths may be completely cured, especially if the radium tube can be buried in the mass of the tumor. Adenomas are the most amenable.

Bronchopneumonia in Children.—Suñer ascribes great differential importance to the continuous dyspnea with bronchopneumonia. When the dyspnea is due to the fever alone, and not to the lung or heart, the child may hold its breath a moment during auscultation. When it does this, it is a favorable sign as to the state of the lungs. Treatment of bronchopneumonia in children is mainly by hygiene and physical measures.

Revista Ibero-Americana de Ciencias Medicas, Madrid

November, 1918, **40**, No. 171

*Early Diagnosis of General Paralysis. R. A. G. Salazar.—p. 321.
Dislocations and Fractures of the Elbow. S. G. Hurtado.—p. 337. Conc'n.
Palography. A. Mut.—p. 347.
*Fibrous Forms of Pulmonary Tuberculosis. G. Triviño.—p. 355.

Early Diagnosis of General Paralysis.—Salazar remarks that there are no somatic signs which can be relied on to differentiate incipient general paralysis from neurasthenia. But he affirms that this is possible by study of the modifications in the mental processes. He has had a number of cases in which general paralysis developed under his eyes. As the dementia affects all the mental processes, the replies to any kinds of questions will soon reveal the mental impairment. He discusses in turn means to test the mental processes, the will power and the affections, and to elicit evidences of changes in them which will differentiate the cases at once from neurasthenia.

Fibrous Forms of Tuberculosis.—Triviño concludes his study of chronic fibrous pulmonary tuberculosis by emphasizing that a slow pulse in chronic tuberculosis is an eminently favorable sign. He urges that the pulse should be regularly recorded. When the pulse keeps at the same rate without change, and if there has been only brief and transient hemoptysis and fever on certain occasions, and if the general health keeps good, the pulmonary process is evidently of a fibrous type, and long survival may be anticipated provided the rules of hygiene are followed.

Revista Medica, Puebla, Mexico

Dec. 15, 1918, **1**, No. 5

*Pathology of Speech. J. Torres.—p. 97. Conc'n.
*Arsphenamin and Neoarsphenamin. A. B. Vasconcelos.—p. 101.
*Subcutaneous Injections of Oxygen. D. Vegara Lope.—p. 103.
*Chloroform Anesthesia with Tuberculosis. E. Olivares.—p. 107.
Notable Case of Transposition of Viscera. J. Farquet.—p. 111.
*The Mission of Medical Societies. J. G. Salazar.—p. 113.

The Pathology of Speech.—Torres here concludes his study of the *patologia del lenguage* in paranoiacs, dements and other grades of mental impairment. He remarks that a man under the influence of liquor runs the entire gamut of the pathology of speech. We see in a demonstrative and well defined epitome the entire involutive process of speech and the brain processes inspiring it. Starting with transient phases of exaltation, even brilliancy, the mental synthesis grows less and less, to absolute dementia, the man's utterances reproducing the mental and organic degeneration which induces the dementia during the brief period while the alcoholic intoxication lasts.

Arsphenamin versus Neo-Arsphenamin. — Vasconcelos relates that notwitstanding the general opinion that neoarsphenamin is superior to arsphenamin, his experience has been that the latter is more effectual. He reserves neoarsphenamin for patients with heart or vascular lesions or tendency to hemorrhage, or with veins difficult of access, or the very nervous. Also for children and when the drug has to be administered by the rectum. For treatment of infants, injection into the colon is the preferable method, he thinks.

Subcutaneous Injection of Oxygen.—Lope extols the advantages of subcutaneous injection of oxygen in cases of asphyxia, this simple but potent measure serving to recall to life many patients otherwise beyond relief. He reiterates that these injections are absolutely harmless, while the whole procedure is so simple that any practitioner can apply it. The oxygen is absorbed by the blood, and the relief was

immediate in the case in which he applied it first, six years ago; the patient in advanced Bright's disease, suffering from recurring attacks of most distressing dyspnea. After injection of 150 c.c. of pure oxygen the improvement was so prompt and so marked that since then Lope has not hesitated to use this simple but heroic measure at need. In certain cases of asphyxia and dyspnea, inhalation of oxygen does not aid in the regeneration of the blood because the inflammatory process and its products in the air passages, or paralysis of the circulation in the lungs, may prevent absorption of the oxygen. It is in such cases that the oxygen injected into the blood proves a life saving measure. It has been advocated for certain other conditions, but he has applied it only in dyspneic states, including the dyspnea with operative or induced pneumothorax. A Pravaz needle with tube to connect it with the oxygen tank is all that is needed in an emergency, but it is better to have a graduated receptacle for the oxygen interposed between the douche can and the needle, with pinchcocks on each tube. By raising the douche can, the graduated jar fills with water; then the douche can is lowered, and the water flows back into it, thus aspirating the oxygen from the tank into the graduated jar. When it is full, the tube is disconnected with the tank and the needle is placed on the tube ready for the injection. The apparatus is illustrated. He advises keeping it charged and ready for use in hospitals or when conditions are liable to require it elsewhere.

The dyspnea subsides, the cyanosis disappears, the fever is reduced, respiration and pulse grow slower, the headache improves or subsides and the patient feels immeasurably better. The improvement may be transient or it may prove permanent. He was called one night urgently to a man of 70 with severe pneumonia and bad heart, who was lying unconscious on the floor near his bed, the cyanosis extreme, the pulse scarcely perceptible, the suffocation alarming. In a few minutes the oxygen injection was made without disturbing the patient as he lay on the floor. About 200 c.c. of pure oxygen were injected under the skin of the right flank. The impressive picture then was presented of actual return to life. In less than fifteen minutes he was sitting up, smiling, in bed, the livid tint all gone. He lived a year and a half longer. Certain writers advocate these injections in treatment of bronchopneumonia and in whooping cough.

Chloroform in Tuberculosis.—Olivares warns that a general anesthesia with chloroform seems to have a decidedly unfavorable action on incipient tuberculosis, whipping it up to a more rapid course. He relates three typical instances of this. Suspicion of tuberculosis should warn against the use of chloroform on account of its depressant action on the liver, etc. If chloroform has to be used, as little as possible should be given and for the shortest time possible.

The Mission of Medical Societies.—Salazar comments on the value of organization and cooperative research. The work of the individual, however meritorious it may be, cannot bear such fruit as when it is brought before others for criticism and stimulation. Especially in Mexico, he says, the diseases peculiar to the country have never been adequately studied. The medical lore and art are European, and it is a question how far they can apply to Mexico, as they were designed for a different country and a different people. It is scarcely known that tabardillo is not exactly the same as exanthematous typhus, that goiter is due to the water, that *mal del pinto* is very prevalent on the Pacific Coast. Medical societies usually dally with fragments of all kinds of subjects, instead of linking up a series of researches which would amount to something definite and valuable.

Revista de Medicina y Cirugia Practicas, Madrid

Nov. 7, 1918, **121,** No. 1529

*Relations between Skin and Heart Disease. E. de Oyarzábal.—p. 129.

Nov. 14, 1918, **121,** No. 1530

Placenta Praevia in Town and Country. J. de la Muela.—p. **161.**

Nov. 21, 1918, **121,** No. 1531

*Enteralgia. R. del Valle y Aldabalde.—p. 193.

Pathology of the Skin in Connection with Internal Pathology.—Oyarzábal explains how impermeability of part of the lung entails hyperemia as the blood piles up against the obstacle. This hyperemia entails catarrh and bronchial secretion which in turn hamper the respiration and heart action. With cyanosis under these conditions, it is difficult to know whether the reduction in the respiration area or the venous stasis is responsible for it. Acute endocarditis, on the other hand, is often secondary to pustules, abscesses, or other processes inducing embolism in the vessels of the skin. Certain small vessels may thus be completely obstructed although the skin may show no signs of it. Embolism in the vessels of the liver may induce jaundice. The cheeks may be red and full but an experienced eye will detect a faint bluish tinge to the red, the first manifestation of heart disease. The circulation is growing sluggish so that the blood does not get fully oxygenated. The obstacles to free circulation of blood lead to stretching of other vessels and the stretched walls let the fluid through and edema results. The lymph plays only a subordinate rôle. The edema with heart disease obeys the laws of gravity, while the edema with nephritis may develop at other than the lowest points. With exophthalmic goiter, there may be a sensation of heat in the skin and profuse sweating. There is also a marked reduction in the resistance to the electric current. This may occur also with sclerodermia and myxedema. In certain cases of exophthalmic goiter the skin resembles the skin of myxedema.

Enteralgia.—Del Valle's patient is a business man with habitual good health who at the age of 41 had pain in the left iliac fossa without fever or vomiting. This pain has recurred at times during the seven years since rebellious to treatment. Worry over his tuberculous child had evidently induced an extremely nervous condition, and there is also probably some subacute inflammation, too slight for detection by palpation but enough, in connection with the extreme nervousness, to explain the rebellious enteralgia. These pains of mixed origin—a slight local lesion and tendency to neurosis—do not spread like ordinary pains along the nerve track nor do they radiate in special directions. The treatment should be directed mainly against the neurosis. As this subsides, the insignificant local lesion gets a rest and may heal at once.

Semana Medica, Buenos Aires

Oct. 17, 1918, **25,** No. 42

Comparison of Antitoxin and Haptinogenin in Diphtheria. J. Mendez.—p. 465.
Fetal Polycystic Kidney. F. A. Deluca.—p. 470.
Tuberculous Pyonephrosis. T. L. Mendez.—p. 473.
Postpartum Shock. S. E. Bermann.—p. 482.
Sugar Treatment of Tuberculosis. V. Delfino.—p. **486.**

Siglo Medico, Madrid

Nov. 2, 1918, **65,** No. 3386

*Catheterization of Arteries and Veins. J. Goyanes.—p. 893.
Prophylaxis of Tuberculosis in Children. B. H. Briz.—p. 895.

Nov. 9, 1918, **65,** No. 3387

Promise of Vaccine Therapy in Influenza. A. Gimeno.—p. 913.
*The Pandemic of Influenza. G. Marañon, G. Pittaluga and A. R. Falco.—p. 916.
Treatment of Pneumonia in Children. B. H. Briz.—p. 921.

Catheterization of Arteries and Veins.—Goyanes comments on the important information to be derived from catheterization of arteries and veins in animals. In the clinic it is possible by this means to introduce a drug so that it will have an immediate and direct action on the focus. Local anesthesia can likewise be induced by way of the artery (Goyanes' method) or by way of the vein (Bier's method). In one case of extremely severe puerperal infection, he introduced the catheter into a collateral of the femoral artery in the triangle of Scarpa, pushing the tip of the catheter into the aorta above its bifurcation. Then the femoral arteries on both sides were vigorously compressed and a solution of a silver salt was injected through the catheter. It had to pass through the internal iliacs and spread thence throughout the whole of the infected visceral region. Goyanes has also introduced a large catheter into an artery to plug it and thus shut off the blood from the field of operation below. He thinks he was the first to apply on man this method of shutting off the blood for a major operation. In one case an extensive osteosarcoma of the root of the right thigh, involving the pelvis,

with ulceration but no obliteration of the arteries, seemed to have originated in the greater trochanter. The tumor had been noticed for ten years and had grown rapidly to a large size in the last eighteen months. A catheter slipped into a condom was introduced into the femoral artery and pushed up to the aorta. Then the condom was distended with a few cubic centimeters of saline. At once the pulse stopped in all the arteries of the sound leg. The catheter was then withdrawn a trifle, after collapsing the condom by letting the fluid in it run out. The pulse then reappeared in the sound limb, showing that the obstruction now was only in the common iliac artery, and the condom was distended anew, completely plugging this artery. The femoral artery was then ligated just above the point where the catheter entered it, which held the catheter firm. The artery was thus firmly plugged, and the limb and nearly half of the pelvis were amputated, sawing the horizontal ramus of the pubis. The shutting off of the blood was so complete that the gluteal and sciatic arteries did not bleed when they were severed. The operation had to be so extensive that it made too much demands on the patient, long debilitated by the sarcoma, and he died ten hours later.

Influenza.—Marañon and his co-workers were sent to France to study conditions there, and they report that the prevailing epidemic is the same disease that has been prevailing in Spain. The therapeutic and prophylactic measures are about the same—nothing new and effectual has been discovered as yet. Vaccine therapy seems to offer the best promise.

Nederlandsch Tijdschrift v. Geneeskunde, Amsterdam

Dec. 7, 1918, **2**, No. 23

*Reform in Medical Education. G. van Rijnberk.—p. 1795.
*Emergency Dressings That Will Not Slip. C. de Mooy.—p. 1806.
*Diagnosis of Nephritis in Children. J. C. Schippers and C. de Lange. —p. 1809. Commenced in No. 22, p. 1733.
The National Association and the Specialists. A. Sikkel.—p. 1824.
Mercuric Chlorid in Influenza. A. J. D. van Twist.—p. 1826.

Reform in Medical Education.—In this fourth editorial on this subject, van Rijnberk quotes the views of Profs. W. H. Welch, F. P. Mall and C. M. Jackson on the aims and ideals of medical education and the best means to realize them.

Emergency Dressings.—De Mooy advises that instead of removing the clothing to obtain access to a wound, the part over the wound should merely be slit and turned back. Then after the wound has been dressed, the slit garment can be brought together over it, and be wound above and below with a strip of gauze. By this means, the dressing is fastened immovably in place. After an amputation, the leg or sleeve of the garment can be tied together below or turned back and fastened. By this method the wounded are spared the discomfort and chilling from stripping off of the garment. Seventeen small diagrams show the application of the principle to wounds in different regions.

Nephritis in Children.—Schippers and De Lange state that examination of the urine of 1,000 children at the Children's Hospital at Amsterdam failed to show any dependable connection between the presence of formed elements, of albumin or of chondroitin and the existence of nephritis in dubious cases. They occur with nephritis but they may also occur in the healthy. On the other hand, functional tests of the kidneys generally reflect the functional capacity of these organs, and they may be relied on to clear up the diagnosis. The two tests applied in the research reported were the accommodation test and the metabolic findings on the Hedinger and Schlayer test diet. The findings with these two methods are tabulated for comparison, filling three pages, as recorded for twenty-two children, ten with clinically normal kidneys and three each with orthostatic or atypical albuminuria or convalescing from acute nephritis or with paedonephritis. The latter is Heubner's term for a benign inflammation of the bladder without phenomena on the part of the vessels, but with a small number of formed elements in the urine and albuminuria, often of an orthostatic type. These tests revealed that one case which seemed to be mere orthostatic albuminuria proved to be strongly suspicious of nephritis, as also two cases, otherwise atypical albuminuria. The fluctuations found even in normal children warn, however, that the limit between health and disease is not sharply defined. Some of the children listed as normal may yet prove to have incipient contracted kidney, explaining the wide range in their supposedly normal condition.

They list further the findings when 0.5 gm. potassium iodid was given to the children in a wafer with a little water. After the fortieth hour the urine was tested regularly for iodin. In the normal children all the drug had been eliminated by the forty-first hour, probably from the twenty-eighth to the thirty-eighth hours. With one child with nephritis, the elimination dragged along to the forty-fourth hour, as also in a case of paedonephritis, and to the forty-second hour with an atypical albuminuria. In all the other children tested no traces of the drug could be found by the fortieth hour. With the accommodation test, the subject drinks from 500 c.c. to 1.5 liters water and the glomerulus function is estimated by the time required for this mass of fluid to be eliminated. Adults may void 500 c.c. or more at the first micturition, and healthy kidneys eliminate the whole and as a rule even a little more, within four hours. The specific gravity falls to 1.002 or 1.001. The diuresis afterward is much reduced, and the specific gravity then reaches 1.025 or 1.030. The children are kept on the usual standard diet for their age for several days. The urine is voided at 6 and at 7 a. m. Then the child drinks 300 c.c. or more of water and nothing more is given to drink till 7 p. m. If it complains of thirst it is given an apple. At 11 a. m., 1 and 4 p. m. it is given a test meal of bread and biscuits, with cake, jam or cheese, but without butter, and at 7 p. m. it gets the usual food. The urine is collected separately at seven two-hour intervals and the amount, specific gravity and salt content are recorded for each specimen, to test the concentration as a tubuli function.

The research reported confirms the value of these two tests when confronted with a puzzling case of albumin or formed elements or chondroitin in the urine with nothing else to suggest nephritis. Repetition of the tests will usually throw light on the most puzzling cases, as the choice of a trade or profession or acceptance for life insurance cannot wait for time to clear up the case by the ultimate outcome. Pollitzer's test was also given a thorough trial and found not practicable. The findings with it demonstrated, however, the importance of extrarenal factors in the diuresis. The kidney functioning cannot be estimated apart from the organism as a whole.

Ugeskrift for Læger, Copenhagen

Dec. 19, 1918, **80**, No. 51

*False Heredity. K. H. Krabbe.—p. 2005.
*Isolation in Influenza. H. Jensen.—p. 2012.
Reduction of Morbidity and Mortality Under Recent Restrictions on Alcohol: P. Heiberg.—p. 2013.

False Heredity.—Krabbe means by this term the development of disease in which the heredity of occupation is involved instead of inheritance of an organic pathologic tendency. The importance of recognition of the true cause is evident, as removal of the cause will put an end to the disturbances in this case, while it is not so easy to cure an organic disease. A specific instance is related, a man presenting intense tremor of the hands for many years, and finally his son developing the same tremor. The diagnosis wavered for some time between paralysis agitans, sclerosis in patches and pseudosclerosis. Krabbe parenthetically remarks that when there is any doubt, one can be certain that neither of these diseases is involved. The son at 33 developed the same symptoms as the father, and for nine years they were accepted as an inherited nervous disease. Then some one investigated the exact nature of the work of the two. They were listed as "instrument makers," but it was found that their business was to fill thermometers with mercury!

Importance of Isolation in Influenza.—Jensen had every person with influenza in his town strictly isolated from the first symptoms, the attendants wearing overgarments and masks. The epidemic thus was restricted to one case in each of ten families, and all but two were imported cases. The population is less than a thousand, but the houses are small and in some as many as ten persons sleep in one room.